DOCUMENT RESUME

ED 048 870	LI 002 666

AUTHOR	Kenney, Brigitte L.
TITLE	Health Science Libraries Today.
INSTITUTION	Interuniversity Communications Council, Bethesda, Md.
SPONS AGENCY	National Library of Medicine (DHEW), Bethesda, Md.
REPORT NO	RM-269
PUB DATE	Dec 67
NOTE	221p.
EDRS PRICE	EDRS Price MF-$0.65 HC-$9.87
DESCRIPTORS	*Information Dissemination, *Information Networks, *Library Networks, Library Services, Library Standards, Library Surveys, *Medical Libraries, *Special Libraries, Use Studies
IDENTIFIERS	*National Library of Medicine

ABSTRACT

This study explores means by which biomedical information might be distributed over a network to physicians and other personnel in the health sciences. Health Science libraries of all types are surveyed in terms of location, facilities, collection, staff, budget, and services. The library's user group is presented, and cooperative agreements among groups of libraries are studied. It is suggested that health-science libraries become major components of the proposed biomedical-information network. The hospital library is to become the physician's primary information source for all types of information; from there, the request is referred to the District Library for professional handling. The Reservoir Library serves as backstop for virtually all needs of District Libraries. The National Library of Medicine provides training and bibliographic services as well as administration of the system. District and Reservoir Libraries are to be linked by electronic means to each other and to the National Library of Medicine. Computer services at the Reservoir Library are available for housekeeping tasks and information retrieval. Extensive retraining of librarians for aggressive information service and carefully established relationships between the three levels of libraries and the National Library of Medicine are essential. (Author/MF)

ED048870

LI 002 666

1

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

EDUCOM
RESEARCH MEMORANDUM
Biomedical Communications Project

② HEALTH SCIENCE LIBRARIES TODAY

Report RM–269

⑤ December 1967

① Brigitte L. Kenney

LYR 38190
③ Interuniversity Communications Council [illegible]

④ EBB00147
Prepared for the
National Library of Medicine (DHEW)
Bethesda, Maryland

Under contract with the
University of Pittsburgh
NIH Contract No. PH-43-67-1152

100 CHARLES RIVER PLAZA BOSTON, MASS. 02114 617-227-1805

ED048870

The research upon which this publication was based was performed pursuant to contract No. PH-43-67-1152 with the National Library of Medicine, Public Health Service, U.S. Department of Health, Education, and Welfare.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS i
LIST OF TABLES iii
LIST OF ILLUSTRATIONS v
PREFACE vi
ABSTRACT vii

HEALTH SCIENCE LIBRARIES TODAY 1

- Standards 3
- Statistics 6
- Location 7
- Facilities 15
- Collections 19
    - Summary 38
- Personnel 40
- Budgetary Support 46
- Services 53
    - Interlibrary Loans 64
    - Summary 71
- List of References Cited 73

THE LIBRARY'S USER GROUP 78

- Practicing Physician 82
- Physicians with Teaching Responsibilities 84
- Research-Oriented Physicians 84
- Biomedical Scientists 86
- Medical Students 87
- Students in the Biomedical Sciences 88
- Para-Medical Personnel 88
- Summary 98
- List of References Cited 100

COOPERATIVE PROGRAMS OF HEALTH SCIENCE LIBRARIES 102

- Harvard 108
- Yale 109
- Nebraska 110
- Wisconsin 111
- Philadelphia 112
- Indiana 114
- U.S. Veterans Administration Library System 114
- New York 115
- Detroit 128
- List of References Cited 135

TABLE OF CONTENTS

Page

THE ROLE OF HEALTH SCIENCE LIBRARIES IN A BIOMEDICAL INFORMATION SYSTEM. 138

Geographic Consideration. 143
User Considerations 144
Staff Considerations. 146
Financial Considerations. 148
Problems in Cooperation 149
Primary Library 153
District Library. 155
Reservoir Library 158
The National Library of Medicine. 161
Summary 163
List of References Cited. 167

BIBLIOGRAPHY 168

APPENDIX A: A SHORT DESCRIPTION OF WORK PERFORMED AT THE INSTITUTE FOR THE ADVANCEMENT OF MEDICAL COMMUNICATION. A-1

APPENDIX B: INTERVIEWS WITH PHYSICIANS AND RESEARCH PERSONNEL B-1

LIST OF TABLES

Table | Page

1. Distribution of Health Science School Libraries by Census Region 8
2. Geographical Distribution of Principal Biomedical Collections by Census Area and State 9
3. States With Major Metropolitan Areas Within Their Borders, and Their Medical Library Holdings 13
4. Volumes Shelved per Square Foot in Fifteen Libraries . . 16
5. Space Allotted Per Reader in Thirteen Libraries 17
6. Distribution of Library Volumes of Medical Schools in the United States 24
7. Average Holdings in Professional Libraries of Hospitals as Estimated by Sampling 27
8. Medical Society Libraries in the United States, by State and Census Region 29
9. Number and Location of Veterans Administration Hospitals, by State and Census Region 32
10. Salaries of Health Science Librarians, by Category, 1964/65 41
11. Distribution of Health Science Library Expenditures, 1960/61, and 1964/65 47
12. Financial Support of Health Science School Libraries, 1964/65, By Census Region and State 48
13. Relationship of Total Institutional Expenditure and Research Funds to Library Support, Four Selected States, 1964/65 49
14. Reference Services, by Type of Question and Method of Transmittal 61
15. Categories of Reference Questions Asked, and Per Cent of Total 63

Table Page

16. Document Delivery Performance Test for Reservoir Libraries. 68

17. Geographic Distribution of Federal and Non-Federal Physicians, by State and Census Region, 1965 94

18. Total Number of Physicians, Total Number of Medical Volumes, and Per Capita Number of Volumes, by State and Census Region. 96

LIST OF ILLUSTRATIONS

Figure — Page

1. Growth of Medical School Library Collections, 1962 and 1965. 23

2. Number of Health Science Libraries and Medical Society Libraries by State and Census Region. 23a

3. Number of Physicians and Number of Medical Library Volumes Available by Census Region and State. . . . 96a

4. Number of Teletype Installations, by Type of Library, State and Census Region 113a

PREFACE

This report was prepared for Mr. Joseph Becker, Director, Information Sciences, EDUCOM. It constitutes background information for a study conducted by Mr. Becker for the National Library of Medicine. Purpose of this study is to explore means by which biomedical information might be distributed over a network to physicians and other personnel in the health sciences.

The assignment given to this writer was to survey medical libraries in terms of location, size, mission, budget, and similar factors. Library services and cooperative ventures were to be surveyed, and the library's user group analyzed. Finally, ways in which libraries might fit into a network were to be studied, emphasizing direct service to physicians.

Data were obtained from the literature, reports, personal communication, and visits with persons active in the medical-library field. A series of interviews were conducted at the University of Mississippi Medical Center and in the city of Jackson, with a small number of physicians engaged in teaching, research, and patient care.

The report was prepared with the active support of the Medical Center administration and the Librarian of the Rowland Medical Library, to whom this writer wishes to express her appreciation.

ABSTRACT

Health Science libraries of all types are surveyed in terms of location, facilities, collection, staff, budget, and services. The library's user group is presented, and cooperative agreements among groups of libraries are studied.

It is suggested that health-science libraries become major components of the proposed biomedical-information network. The hospital library is to become the physician's primary information source for all types of information; from there, the request is referred to the District Library for professional handling. The Reservoir Library serves as backstop for virtually all needs of District Libraries. The National Library of Medicine provides training and bibliographic services as well as administration of the system.

District and Reservoir Libraries are to be linked by electronic means to each other and to the National Library of Medicine. Computer services at the Reservoir Library are available for housekeeping tasks and information retrieval.

Extensive retraining of librarians for aggressive information service, and carefully established relationships between the three levels of libraries and the National Library of Medicine are essential.

HEALTH-SCIENCE LIBRARIES TODAY

There are at present approximately 6,400 libraries in the United States serving the biomedical community (45). They are located in different kinds of institutions and serve differing clienteles. Institutional missions vary widely and so does the size of both the institution and its library. For the purpose of this report, the following are considered "medical libraries," or to use a more all-encompassing term, "health-science libraries:"

- Medical School Libraries
- Dental School Libraries
- Nursing School Libraries
- Veterinary School Libraries
- Pharmacy School Libraries
- Hospital Libraries, except patients' libraries
- Medical Society Libraries
- Special Libraries holding biomedical collections
- Public Libraries holding biomedical collections
- University Libraries holding biomedical collections
- Governmental Libraries holding biomedical collections

Not included are specialized information centers and information-analysis centers, whose mission is usually different from that of a library.

In this report, the word "library" should be interpreted to mean "health-science library" unless otherwise stated. A library is a collection of informational materials, organized for use, and serviced by a staff especially trained for the library function. This eliminates from further discussion departmental collections, assembled for the convenience of staff, but neither organized for use nor serviced by library-trained personnel. It does not eliminate libraries in small hospitals, staffed by untrained personnel, as long as their primary job function is that of servicing the library collection.

Standards.

In order to assess the health-science-library resources of the nation, it is necessary to look at existing standards and compare them to data available for the various types of libraries. It is far easier to use quantitative standards, if they exist, than to assess strengths and weaknesses of libraries qualitatively. Numbers of volumes, size of physical facilities, staff, population served, and selected service statistics are available to some extent, but standards are mostly qualitative rather than quantitative, and frequently vague. Quantitative data alone cannot measure libraries adequately and therefore the assessment of library resources is at best an educated guess, with much subjective judgment taking the place of hard facts.

In this report, available standards are described and statistics are compared to the standards insofar as this is possible. The findings are then discussed in an attempt to interpret them meaningfully.

During the past two years, two documents have appeared which provide excellent guidelines for the assessment of the adequacy of health-sciences libraries. They are primarily designed for the administrator who wishes to evaluate his own library, and they provide him with qualitative criteria, which he may use at his discretion. Because of the absence of quantitative standards, this evaluation is of necessity subjective, with a great deal of personal knowledge of a given local situation necessary to come up with answers.

Guidelines for Medical School Libraries appeared in 1965 (13). Prepared by a Joint Committee of the Association of American Medical Colleges and the Medical Library Association, it is an important step toward providing an instrument for evaluating present and planned medical-school libraries. Detailed guidelines for services, budget, personnel, organization, resources and facilities are designed to aid the medical school administrator "in developing, maintaining, and assessing library services in accord with modern concepts of quality."[1]

Another report, The Health Sciences Library: Its Role in Education for the Health Professions, appeared in 1967 (15). It, too, was sponsored by the American Association of Medical Colleges, and is designed to provide the National Library of Medicine with some firm criteria by which grant applications can be evaluated. In its recommendations it sets forth important considerations for the improvements needed in health sciences libraries in order that they might assume their rightful role in the provision of vigorous information services.

Almost all of the professional organizations in the medical field have established some type of standard for their libraries. We find such standards for dental school libraries, pharmacy libraries, hospital libraries and nursing school libraries. Most of these are brief, setting out criteria for collection ("good, current, usable, classified properly"), staff ("qualified librarian" or "certified medical librarian", "full-time, professionally-trained"), and services ("reference, bibliographic services, interlibrary loans, teaching use of the library, abstracting, indexing, translations") (25, 26, 27).

---

[1] p. 5

Not all of the above criteria are recommended for all types of libraries; they are treated but briefly here, and will be discussed in some detail later.

Statistics:

In addition to standards against which libraries may be measured, there must be data on those same libraries, so that measurement can take place. Statistics have not been available on a regular basis until recently, when a Committee of the Medical Library Association began to be concerned with the lack of reliable data and began to collect them from medical school libraries, medical society libraries, pharmacy and veterinary school libraries. Data for other types of health science libraries are scarce; especially is this true for the holdings of large general libraries, which include the biomedical sciences as one of their subject fields.

A number of surveys were made during the past fifteen years; most of these dealt with medical school libraries, although other types of health science libraries have been discussed narratively. Major surveys are those of Deitrick (1953), Bloomquist (1962), Keenan (1965), the Heart, Cancer and Stroke Commission report (1965), the Herner report (1966), and statistics of health science school libraries (1966), published in 1966 and 1967 (10, 4, 21, 45, 17, 24). The American Hospital Association surveyed a sample of hospital libraries in 1964, (12) and Pings reviewed nursing library literature in that same year (37). Most of the following discussion is based on data from these sources, supplemented by other information when available.

Location.

Medical library resources are unevenly distributed over the country (Table I). While we find a heavy concentration of biomedical collections in the northeast and along the Atlantic seaboard, there are far fewer in the south, none at all in five mountain states, and only in California do we find a considerable number again. Large metropolitan areas are the site of most medical schools, research institutes in the medical field, and large medical societies with important collections. Other types of libraries (public and academic) with sizable holdings in the field tend to be clustered in or around these same metropolitan areas, offering the health science practitioner and researcher considerable resources.

Table II shows this same geographic arrangement and presents data for all types of biomedical collections. It is largely based on the work done by Orr in 1963 (32); only the "academic" category has been updated to reflect later figures. The information is therefore not up-to-date, but some interesting facts do emerge. Not only do we find a concentration of medical school "academic" libraries in the Northeast and North Central region, but other types of libraries with biomedical collections are also clustered there. For example, there are eighteen professional libraries in the New England and Middle Atlantic states, while California has nine, and the North Central states have nine, or a total of thirty-seven for all three areas. The rest of the country has seventeen professional libraries. The same is true for hospital libraries;[1] there are eighty-seven in the

---

[1] The number of hospital libraries in this table is only a small part of the total number; it is assumed that Orr only included those with significant collections.

TABLE I

DISTRIBUTION OF HEALTH SCIENCE SCHOOL LIBRARIES BY CENSUS REGION

New England

Maine	-
New Hampshire	1
Vermont	1
Massachusetts	3
Rhode Island	-
Connecticut	1
Total	6

Middle Atlantic

New York	16
New Jersey	4
Pennsylvania	12
Total	32

E. North Central

Ohio	6
Indiana	5
Illinois	7
Michigan	8
Wisconsin	3
Total	29

W. North Central

Minnesota	2
Iowa	4
Missouri	9
N. Dakota	1
S. Dakota	1
Nebraska	3
Kansas	2
Total	22

S. Atlantic

Delaware	-
Maryland	2
Washington D.C.	4
Virginia	2
West Virginia	1
N. Carolina	3
S. Carolina	1
Georgia	5
Florida	3
Total	21

E. South Central

Kentucky	4
Tennessee	3
Alabama	2
Mississippi	1
Total	10

W. South Central

Arkansas	1
Louisiana	3
Oklahoma	2
Texas	8
Total	14

Mountain

Montana	-
Idaho	1
Wyoming	-
Colorado	1
N. Mexico	1
Arizona	-
Utah	1
Nevada	-
Total	4

Pacific

Washington	1
Oregon	2
California	9
Alaska	-
Hawaii	1
Total	13

Grand Total 151

Sources: (2, 23, 24)

TABLE II

GEOGRAPHICAL DISTRIBUTION OF PRINCIPAL BIOMEDICAL COLLECTIONS BY CENSUS AREA AND STATE

(Volumes in thousands: 000)

STATE & CENSUS REGION	ACADEMIC		HOSPITAL		GOVERNMENT		PROFESSIONAL		INDUSTRIAL		PUBLIC		FOUNDATION		TOTAL	
	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.
New England																
Maine	--	---	--	---	--	---	--	----	--	---	--	---	1	6	1	6
New Hamp.	1	64*	--	---	--	---	--	---	--	---	--	---	--	---	1	64
Vt.	1	25	--	---	--	---	--	---	--	---	--	---	--	---	1	25
Mass.	3	476	17	125	1	6	1	120	--	---	--	---	1	4	23	732
R.I.	--	---	3	8	1	7	1	45	--	---	--	---	--	---	5	60
Conn.	1	366	10	36	2	23	1	26	1	15	--	---	2	24	17	489
Totals	6	931	30	169	4	36	3	190	1	15	--	---	4	34	48	1,375
Middle Atlantic																
N.Y.	16	958	47	277	5	73	10	670	11	110	--	---	2	27	91	2,116
N.J.	4	120	5	75	--	----	1	33	11	74	--	---	--	---	21	301
Pa.	12	316	5	42	1	9	4	248	--	---	--	---	1	10	23	624
Totals	32	1,394	57	394	6	82	15	951	22	184	--	----	3	37	135	3,041
E. North Central																
Ohio	6	276	13	127	--	---	2	98	3	13	--	---	--	---	24	514
Ind.	5	133	8	30	--	---	1	5	4	66	--	---	--	---	18	234
Ill.	7	526	11	84	1	2	--	---	2	33	1	150	--	---	22	796
Mich.	8	362	12	86	1	8	--	---	3	30	--	---	--	---	24	487
Wisc.	3	166	2	6	--	---	--	---	--	---	--	---	--	---	5	172
Totals	29	1,463	46	333	2	10	3	103	12	142	1	150	--	---	93	2,202

TABLE II

GEOGRAPHICAL DISTRIBUTION OF PRINCIPAL BIOMEDICAL COLLECTIONS BY CENSUS AREA AND STATE

(Volumes in thousands: 000)

STATE & CENSUS REGION	ACADEMIC		HOSPITAL		GOVERNMENT		PROFESSIONAL		INDUSTRIAL		PUBLIC		FOUNDATION		TOTAL	
	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.
W. North Central																
Minn.	2	183	6	121	--	---	3	67	--	---	--	---	--	---	11	371
Iowa	4	98	3	10	--	---	--	---	1	7	--	---	--	---	8	114
Mo.	9	272	4	18	--	---	2	78	1	1	1	4	--	---	17	372
N.D.	1	27	2	16	--	---	--	---	--	---	--	---	--	---	3	43
S.D.	1	17	1	2	--	---	--	---	--	---	--	---	--	---	2	19
Neb.	3	171	3	18	--	---	--	---	--	---	--	---	--	---	6	190
Kans.	2	84	5	39	1	4	1	1	--	---	2	10	--	---	11	138
Total	22	852	24	224	1	4	6	146	2	8	3	14	--	---	58	1,246
South Atlantic																
Del.	--	---	--	---	--	---	1	7	2	49	--	---	--	---	3	56
Md.	2	309	7	62	2	84	1	84	--	---	--	---	--	---	12	538
D.C.	4	116	--	---	8	1,598	1	11	--	---	--	---	--	---	14	1,726
Va.	2	143	2	12	--	---	1	8	--	---	--	---	1	1	5	163
W. Va.	1	76	1	2	--	---	--	---	--	---	--	---	--	---	2	78
N.C.	3	213	2	6	1	10	2	33	--	---	--	---	--	---	8	262
S.C.	1	38	2	5	--	---	--	---	--	---	--	---	--	---	3	43
Ga.	5	143	4	12	2	35	--	---	--	---	--	---	--	---	11	190
Fla.	3	161	5	17	2	21	--	---	--	---	--	---	--	---	10	199
Total	21	1,199	23	116	15	1,748	6	143	2	49	--	---	1	1	68	3,256

TABLE II

GEOGRAPHICAL DISTRIBUTION OF PRINCIPAL BIOMEDICAL COLLECTIONS BY CENSUS AREA AND STATE

(Volumes in thousands: 000)

STATE & CENSUS REGION	ACADEMIC		HOSPITAL		GOVERNMENT		PROFESSIONAL		INDUSTRIAL		PUBLIC		FOUNDATION		TOTAL	
	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.
E. South Central																
Ky.	4	159	1	8	--	---	--	---	--	---	--	----	--	---	5	167
Tenn.	3	150	3	10	--	---	--	---	1	3	1	7	--	---	8	171
Ala.	2	84	3	11	--	---	--	---	--	---	--	---	--	---	5	95
Miss.	1	49	4	11	1	15	--	---	--	---	--	---	--	---	6	75
Total	10	442	11	40	1	15	--	---	1	3	1	7	--	---	24	508
W. South Central																
Ark.	1	52	2	8	--	---	--	---	--	---	--	---	--	---	3	60
La.	3	160	2	10	1	9	--	---	--	---	--	---	--	---	6	179
Okla.	2	65	2	7	--	---	1	9	--	---	--	---	--	---	5	81
Texas	8	232	6	42	2	48	3	43	1	7	--	---	--	---	20	372
Total	14	509	12	67	3	57	4	52	1	7	--	---	--	---	34	692
Mountain																
Mont.	--	---	1	3	1	27	--	---	--	---	--	---	--	---	2	30
Idaho	1	2	--	---	--	---	--	---	--	---	--	---	--	---	1	2
Wyoming	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---
Colorado	1	71	4	39	--	---	2	46	--	---	1	5	--	---	8	160
N. Mex.	1	33	2	13	--	---	1	4	--	---	--	---	--	---	4	50
Ariz.	--	---	--	---	--	---	1	10	--	---	--	---	--	---	1	10
Utah	1	63	1	7	--	---	--	---	--	---	--	---	--	---	2	70
Nev.	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---
Totals	4	169	8	62	1	27	4	60	--	---	1	5	--	---	18	322

TABLE II

GEOGRAPHICAL DISTRIBUTION OF PRINCIPAL BIOMEDICAL COLLECTIONS BY CENSUS AREA AND STATE

(Volumes in thousands: 000)

STATE & CENSUS REGION	ACADEMIC		HOSPITAL		GOVERNMENT		PROFESSIONAL		INDUSTRIAL		PUBLIC		FOUNDATION		TOTAL	
	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.	No.	Vols.
Pacific																
Wash.	1	106	1	5	--	---	2	34	1	1	--	---	--	---	5	145
Oregon	2	103	--	---	1	3	--	---	--	---	--	---	--	---	3	106
Calif.	9	804	27	142	4	28	9	155	3	22	1	22	--	---	53	1,173
Alaska	--	---	--	---	1	2	--	---	--	---	--	---	--	---	1	2
Hawaii	1	10	2	8	--	---	1	24	--	---	--	---	--	---	4	43
Total	13	1,023	30	155	6	33	12	213	4	23	1	22	--	---	66	1,469
Grand Total	151	7,983	241	1,558	39	2,014	53	1,857	45	430	7	198	8	71	544	14,112

---

* Figures do not correspond to totals entirely because of rounding.

Sources: (24, 32)

FOR GRAPHIC PRESENTATION OF TABLE II, SEE FIGURE 2, PAGE 23A northeast, seventy in the north central area and twenty-seven in California, while the rest of the country has only fifty-seven.

When we consider the nine largest metropolitan areas in the United States, along with the states in which they are located, the picture becomes even clearer (Table III). Over half of all biomedical volumes are located in these eight states; since most medical centers are located in the large cities rather than elsewhere in the state, it may be assumed that most of the large collections are also located within these same cities or the metropolitan area immediately adjacent.

TABLE III

STATES WITH MAJOR METROPOLITAN AREAS WITHIN THEIR BORDERS, AND THEIR MEDICAL LIBRARY HOLDINGS

STATE	METROPOLITAN AREA AND POPULATION (in 000)		TOTAL STATE POPULATION (in 000)	TOTAL LIBRARY HOLDINGS FOR STATE
N.Y.	New York	11,260	16,782	2,115,600
Calif.	Los Angeles	6,776	15,717	1,173,300
	San Francisco	2,935		
Ill.	Chicago	6,637	10,081	795,700
Pa.	Philadelphia	4,617	11,319	654,800[1]
	Pittsburgh	2,367		
Mich.	Detroit	3,972	7,823	486,300
Mass.	Boston	3,199	5,148	729,800
D.C.	Washington	2,323	764[2]	1,643,000
Mo.	St. Louis	2,239	4,319	372,400
Totals		46,325	71,953	7,970,700

[1] Library holdings from Orr table; not updated.

[2] D.C. population smaller than metropolitan area, which encompasses parts of Md., Va.

Sources: World Almanac, 1967.
Table II

While over half of all biomedical books are in these libraries, only slightly more than one third of the U.S. population resides within the borders of the eight states. An unequal distribution of biomedical library resources in relation to population is thus evident. Later in this report, we will relate this data to workers in the health professions, showing that they are indeed unequally served, insofar as local resources are concerned.

Facilities.

Health sciences libraries have suffered from a chronic lack of space for a very long time. The cry for more space, and more adequate space for library use, is prevalent in all the reports that were examined. When Bloomquist surveyed medical school libraries in 1962, he found that many of the libraries responding to his inquiry had been built many years ago, and were filled to capacity (4). He quotes a 1957 survey, which reported that more than half of the libraries were filled, while others were expected to reach capacity within a very few years. Only twenty-seven new libraries have been built since then, according to figures covering the years between 1958-1964 (24).

Of these new libraries, several have already reached capacity again, and can no longer provide space for 10 vols. per sq. ft., as suggested by Metcalf and cited in the report on the Health Sciences library (15). Nor were they able to seat 20 per cent of the user group as stated in the Guidelines, at the suggested square footage of 25 sq. ft. per reader. Eleven of the twenty-seven libraries had far less seating space than the suggested minimum, (one library as low as 6 sq. ft. per reader), while five libraries shelved more volumes per square foot than the suggested ten.

A random sample drawn from Health Science Library Statistics shows the following number of volumes shelved per square foot:

TABLE IV

Standard	10.0 volumes per sq. ft.*
Library A	9.0
Library B	25.8
Library C	12.4
Library D	7.1
Library E	5.3 (new library)**
Library F	10.2
Library G	14.2
Library H	10.3
Library I	16.0
Library J	24.9 (new library)**
Library K	9.5 (new library)**
Library L	8.1
Library M	23.2
Library N	20.1
Library O	9.1 (new library)**

* As stated by Metcalf
** Built since 1958

Bloomquist states that medical literature doubles every ten years; it is clear that even in relatively new libraries this factor has not been considered sufficiently, while older ones have become so overcrowded as to be inconvenient to use, or had to resort to off-premise storage and similar means of alleviating the pressure.

A vigorous weeding policy and a systematic program of replacing lesser-used materials might alleviate some of the problem; however, the pressure of building ever larger collections, to reach the oft-quoted goal of 100,000 volumes, has surely been a factor in medical librarians' reluctance to pare their collections.

Another random sample was chosen to assess reader space in thirteen sample libraries:

TABLE V

SPACE ALLOTTED PER READER IN THIRTEEN LIBRARIES

Standard	25 sq. ft. per reader*
Library A	3.6
Library B	16.1
Library C	26
Library D	12.1
Library E	23
Library F	16.3
Library G	11.8
Library H	37 (new library)
Library I	6
Library J	8.5
Library K	11.5
Library L	11.2
Library M	11.0

* As stated in Guidelines

Only one library out of thirteen meets the suggested standard of 25 sq. ft. per reader, all others offer far less space. This may, of course, be justified by the availability of other space nearby; if a study hall were located adjacent to the library, it would be perfectly acceptable to reduce seating space within the library proper; however, since most of the sample libraries are not new, we doubt that such space is available.

It is clear, then, that space needs are probably the most pressing of all library needs. The passage of the Medical Library Assistance Act of 1965 brought a substantial amount of federal funds, (1) part of which ($10,000,000 per year) was specifically set aside to provide funds for building construction. Although this is a considerable amount, it should be remembered that buildings are expensive, and that this money is more in the nature of an incentive grant to provide the stimulus for local funding of medical library construction. At an estimated cost of $40 per sq. ft., (45) a library housing 100,000 volumes, with necessary meeting rooms, audio-visual facilities, staff space, and room for machinery necessary in the day-to-day operations, would probably cost in the neighborhood of $900,000 to $1,000,000 today; inflation increases this amount considerably every year. Thus no more than twenty library buildings could be authorized and funded per year, if each library were to receive 50 per cent of its building funds from the federal grant money.

The Heart, Cancer and Stroke Report estimates libraries' space needs to be about 3,200,000 sq. ft. at a cost of over $137 Million. This figure covers only the medical, dental and osteopathic schools; the total space needs of health sciences libraries are far larger, and very difficult to estimate, since precise data on present size of physical facilities are not available.

Although the substantial funds provided by the Medical Library Assistance Act are going to be of considerable help in overcoming the space deficiency, at least in larger medical libraries, other ways will have to be found to provide necessary space for books, readers and staff in those libraries which can make the greatest contribution to improvement of service. Ways in which this may be accomplished are discussed later in this report.

Collections.

Guidelines for Medical School Libraries states:

> "Without adequate access to that segment of recorded knowledge which is most relevant to the needs of its community of library users, a medical school is severely handicapped in carrying out its functions and in meeting its objectives...the library, in order to carry out its functions, must have adequate resources...(this includes) all forms of recorded information...books, periodicals, serials, technical reports, dissertations, pamphlets, manuscripts, films, microtexts, slides, audio discs or tapes..."[1]

It recommends a firm, written acquisitions policy regarding the scope and coverage of the library collection. There is a statement that "each institution has the obligation to provide sufficient library support and supply those materials needed by its students in the instructional program without undue reliance on outside agencies."[1] (Italics supplied). It specifies five levels of collections to serve particular needs, e.g. "General Information Collection," designated as outside the scope of the particular library, but users need minimum access, "Working Collection" which would supply adequate coverage of a field in broad outline only, "General Research Collection," for the needs of graduate students in an in-scope subject field, "Comprehensive Collection," one which includes both current and historical material in English and other languages, and "Exhaustive Collection" which includes virtually everything published on a given subject.

No mention is made here of a certain number of volumes or periodical titles as being "ideal" or "sufficient," although 100,000 volumes as a generally accepted standard is mentioned in the introduction, with a caveat, however. It "has significance only if one can specify the quality, scope, and other characteristics of the collection."[1]

---

[1] Guidelines, p. 28

The "magic 100,000" is mentioned by others, however. Bloomquist (4) quotes Rogers, Esterquest and Meyerhoff as recommending that number of volumes as a "reasonable standard,"[2] although he stresses that this number should be considered merely minimum. Subscriptions to 1,200 to 1,500 journals are suggested as minimum for this type of publication. Bloomquist points out that this constitutes but a small part of the 2,300 journals indexed by the National Library of Medicine, and adds that these represent only the more important ones, selected from a total of 8,939 titles in the biomedical field. This number in itself constitutes only a part of those journals generally required in health sciences libraries, which must also provide chemistry, biology, and related subjects.

The 100,000 volume figure is again mentioned in the report on the health sciences library (15) in conjunction with the "ninety per cent library." The "ninety per cent library" concept suggests that "every library smaller than the National Library of Medicine should reasonably be expected to satisfy at least ninety per cent of the requests it receives."[3] This would apply to smaller libraries as well as large ones. Two routes toward satisfying those objectives are mentioned: the first requires that virtually everything printed in the health sciences field be acquired, the other would require careful matching of holdings to user requirements. The report continues, "surveys within the United States indicate that the majority of our health sciences libraries have developed along the former route...it is unfortunate that size has become equated with the presumed strength or effectiveness of the library...." We then find the firm recommendation that user requirements be studied carefully and collections and services be planned on the basis of such studies.

---

[1] Guidelines, p. 28

[2] Bloomquist, p. 7-8

[3] Report on Health Sciences Libraries, p. 17

In contrast to this statement that a set quantitative standard might not be the best approach to achieving excellence, we find the *Heart, Cancer and Stroke Report* (45) to be rather blunt about setting quantitative standards:

> "One of the most significant inadequacies of the Nation's medical libraries is that they have only about half the books, journals, and other resources they need. The average medical school library has 77,000 volumes and *should have 100,000*. The average dental school library has only 13,000 volumes and *needs 25,000*. The nursing school library has an average of 1,140 volumes and *should have 3,750*. The 206 hospitals of over 400 beds have libraries averaging only 2,657 volumes when they *need at least 10,000*."[1] (Italics supplied)

The report contains a table showing medical library collection needs, based on suggested standards. Medical, dental and nursing schools, as well as hospitals are listed, with present "average volumes," suggested standards, the ensuing deficit, multiplied by the number of institutions, and the total costs for alleviating the calculated deficiencies, which amounts to roughly $103,000,000!

It is true that most of the health sciences libraries are inadequate, but to state categorically that it would take over $100,000,000 to cure what ails them is probably a gross oversimplification. The picture is much more complex than one of numbers alone, and a more reasonable approach might be to design an instrument for evaluating present collections in terms of mission and size of user group. From the results of such an evaluation can come some meaningful data which may be used to establish criteria for each library's collection.

---

[1] p. 393

Table II shows the approximate number of volumes available to the biomedical community in each state and Census region. Further work should be done to update and complete this compilation; quite a bit could be learned from it, if it could include data on all hospital libraries, of whatever size, as well as those general collections in academic, public and special libraries, which contain materials in medical and allied fields.

The 1966 data show that only seventeen of the eighty-eight libraries reporting hold more than 100,000 volumes (24). However, Table VI, which compares Bloomquist's data with the BMLA data of 1962/63 and 1964/65, shows the number of volumes to be rising each year. Figure I compares BMLA data for 1962/63 and 1964/65 and shows them in graphic form. It is interesting to note that the largest increase occurred in the 60,000 to 90,000 volume group. Of the twenty-five libraries in this group, seven owned between 70,000 and 90,000, while we find nine in the 90,000 to 120,000 group. At the present rate of growth, a considerable number of libraries should reach the 100,000 volume figure within a few years, if this is indeed a figure which would provide for reasonable service to the user group.

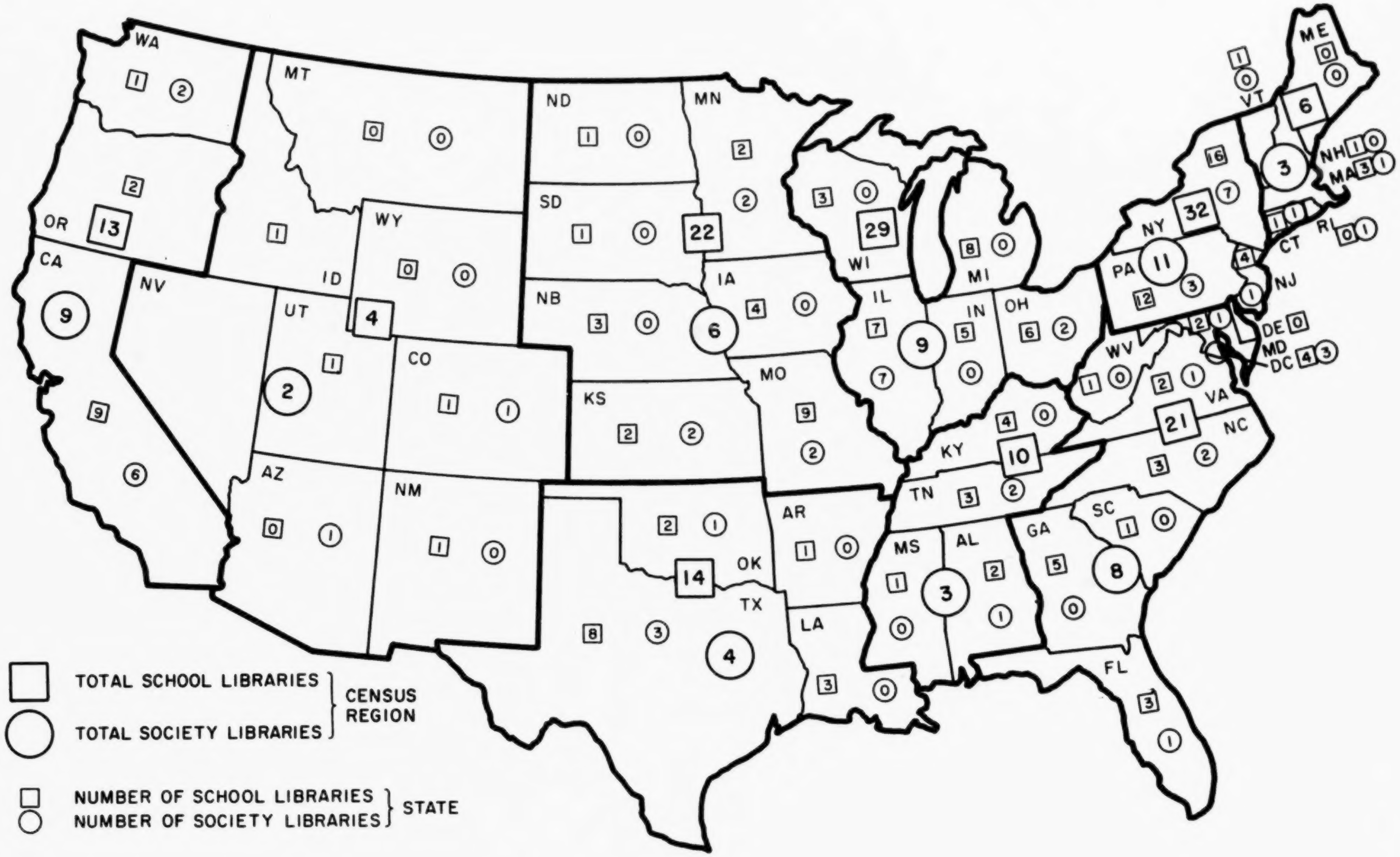
TOTAL SCHOOL LIBRARIES
TOTAL SOCIETY LIBRARIES
CENSUS REGION
NUMBER OF SCHOOL LIBRARIES
NUMBER OF SOCIETY LIBRARIES
STATE
WA 1 2
OR 2
13
CA 9 6
9
MT 0 0
ID 1
WY 0 0
4
NV
UT 1
2
CO 1 1
AZ 0 1
NM 1 0
ND 1 0
SD 1 0
NB 3 0
KS 2 2
MN 2 2
22
IA 4 0
MO 9 2
6
OK 2 1
TX 8 3
14
4
AR 1 0
LA 3 0
WI 3 0
29
IL 7 7
MI 8 0
IN 5 0
OH 6 2
9
KY 4 0
TN 3 2
10
MS 1 0
AL 2 1
3
GA 5 0
SC 1 0
FL 3 1
8
NC 3 2
VA 2 1
WV 1 0
MD 2 1
DC 4 3
DE 0
21
NY 16 7
PA 12 3
NJ 4 1
32
11
ME 0 0
VT 1 0
NH 1 0
MA 3 1
CT 1 1
RI 0 1
6
3

FIGURE 2. Number of health-science school libraries and medical-school libraries by state and census region, 1965. Sources: "Health Science Libraries of National, State and Local Medical Organizations," Bull. Med. Lib. Assoc. 55, 191-200 (1967); "Library Statistics of Schools in the Health Sciences, Part I," Bull. Med. Lib. Assoc. 54, 206-229 (1966).

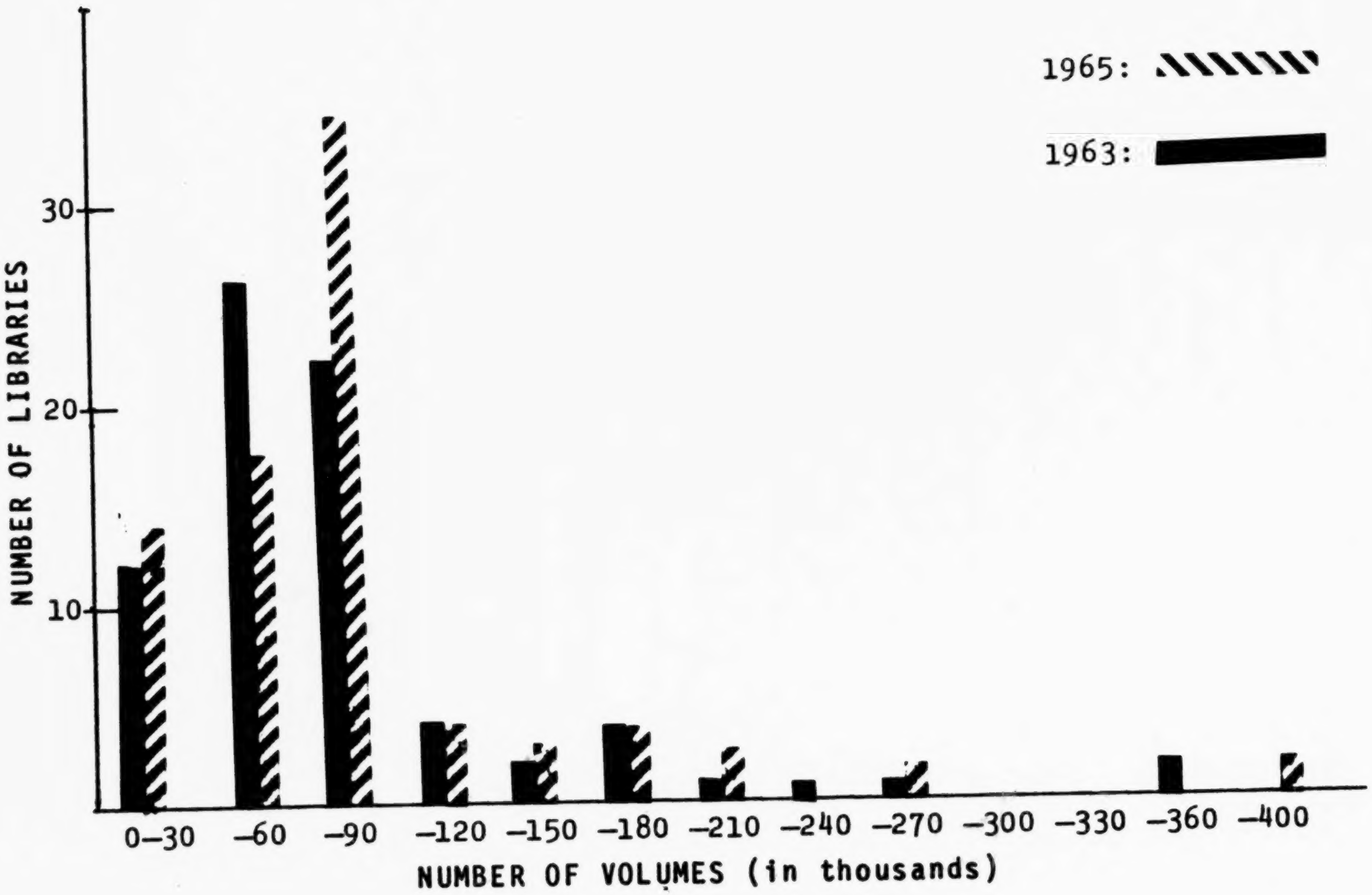

FIGURE 1. Growth of medical-school library collections, 1963 and 1965, presented in increments of 30 000 volumes. Source: (4), (21), (24).

TABLE VI

DISTRIBUTION OF LIBRARY VOLUMES OF MEDICAL SCHOOLS IN THE UNITED STATES

	1961/62		1962/63		1964/65	
ITEM	NO. OF INST. REPORTING	VOLS.	NO. OF INST. REPORTING	VOLS.	NO. OF INST. REPORTING	VOLS.
Maximum number reported by any institution	84	340,446	75	352,575	88	399,541
Third Quartile		77,083		86,038		91,041
Median		54,779		61,000		67,177
First Quartile		36,000		42,067		42,264
Lowest Number reported by any institution		12,000		6,000*		16,792

* New school

Sources: (4, 21, 24)

It might be questioned that even a 90 per cent library or 100,000 volumes can supply most of the needs of its clientele today, because of the broad, and often interdisciplinary research being carried on at medical schools, which requires a great deal more than a collection in medicine and closely allied sciences. Thus we must consider other, nearby library resources of a more general nature, when assessing local adequacy. Little hard data are available to support investigation, but it can be stated with some assurance that large metropolitan centers, with their rich library resources tend to own more of the materials needed by the medical researcher as well as other research scientists. Not only are more than half of all available volumes in the biomedical sciences clustered here, but we also find that large universities maintain extensive campus libraries; research institutes, industrial corporations and public libraries add to the total, and small, highly specialized collections are maintained by many other agencies and institutions.

The National Library of Medicine.

When considering the resources of medical libraries in the United States, the National Library of Medicine plays a unique role. In no other field, except agriculture, is there a national library responsible for the provision of back-up resources to local libraries. With its collection of 626,811 monographs and serial volumes, 458,121 theses and pamphlets, and 65,616 non-book materials, or a total of 1,165,141 (30) it is indeed a rich resource for the nation. While suffering from neglect for many years, it has recently been accorded a position as the resource library for the nation's biomedical libraries, and has been given substantial increases in both funds and responsibilities to carry out its function. Its position today is one of leadership in the provision of materials, bibliographic control, and services to the biomedical community, which is second to none.

Other Health Sciences Libraries.

Data are available for several other types of health sciences libraries. When Yast and Giesler surveyed a sample of non-federal hospital libraries in 1962, (50) they found that 3,192 out of 5,444 hospitals had libraries, most of them in hospitals of over 400 beds. The average library had 561 books, those with over 400 beds however, had an average collection of 2,657 volumes. Thirty-three journals were received by the average library, and four abstracting services, while those with 400 beds or over held 134 journal titles and seven abstracting services. However, it is interesting to note that this average figure of seven is only valid for 46.10 per cent of the larger libraries, the others had no abstracts at all. Libraries in hospitals with 100 beds or less held an average of 156 books, twelve journal subscriptions and two abstracting services.

This data is in sharp contrast to the standards for hospital libraries (26) which state that a "general hospital library of 100 beds or over (should have)...a minimum of 1,000 volumes of medical and allied scientific literature"...(and should) receive regularly no less than twenty-five periodicals...and own the most important medical and allied scientific indexes."

Table VII, reproduced from the Yast and Giesler survey, presents data on 724 hospital libraries of differing sized; the accompanying report states that this is indeed a representative sample of all hospital libraries in the United States.

TABLE VII

AVERAGE HOLDINGS IN PROFESSIONAL LIBRARIES OF HOSPITALS AS ESTIMATED BY SAMPLING

ospitals By Bed Size ategory	BOOKS			PAMPHLETS			CURRENT SUBSCRIPTIONS						FILMS & SLIDES			TAPES		
							JOURNALS			ABSTRACTING SERV.								
	Hospitals Having		Avg. Size Collect	Hospitals Having		Avg. Size Collect	Hospitals Having		Avg. Size Collect	Hospitals Having		Avg. Size Collect	Hospitals Having		Avg. Size Collect	Hospitals Having		Avg. Size Collect
	No.	%		No.	%		No.	%		No.	%		No.	%		No.	%	
ospitals ll Sizes:	3,192	100.0	561	2,069	64.8	202	2,990	93.7	33	790	24.7	4	215	6.7	17	546	17.1	108
By Bed Size:																		
- 99	1,431	100.0	158	927	64.8	59	1,320	92.2	12	309	21.6	2	60	4.2	1	192	13.4	10
00 - 399	1,555	100.0	654	989	63.6	244	1,468	94.4	38	386	24.8	4	127	8.2	17	275	17.7	82
00 and over	206	100.0	2,657	153	74.3	747	202	98.1	134	95	46.1	7	28	13.6	35	79	38.3	226

ource:

Reproduced from Yast, Helen T. A report on the Survey of Hospital Professional Library Service. American Hospital Association, 1964, Table 2 (Appendix).

The table shows clearly how far below even the minimum standards cited above most hospital collections fell in 1962; there is no reason to believe that this situation has improved substantially since then.

Medical Society libraries were surveyed in 1955, 1964, and again in 1966 (14). Only the latest data will be considered here. Fifty-eight libraries were identified, ranging from very small collections (a County Medical Society library, for example), to nationally-known large resource collections, such as the library of the New York Academy of Medicine (356,000 volumes).

Medical Society libraries are those sponsored by medical associations of states, counties, and cities. Their primary clientele is the membership of the particular association or society which supports the library; however, most of them are open to the public and may therefore be considered as resource libraries for the biomedical community.

These libraries are distributed unevenly, as are the other types of health sciences collections; most of them are clustered around the same nine large metropolitan centers mentioned above, with New York being far and away the largest center of such collections. Table VIII presents total holdings by state, arranged within Census region.

Some of these libraries date back many years and are rich in historical materials, well-supported currently, and indeed are superior resources for health practitioners as well as researchers.

TABLE VIII

MEDICAL SOCIETY LIBRARIES IN THE UNITED STATES, BY STATE AND CENSUS REGION

AREA	NO.	VOLS. (000)
New England:		
Massachusetts	1	15
Rhode Island	1	45
Connecticut	1	28
Total	3	88
Middle Atlantic:		
New York	7	649
New Jersey	1	40
Pennsylvania	3	250
Total	11	339
E. North Central:		
Ohio	2	115
Illinois	7	250
Total	9	365
W. North Central:		
Minnesota	2	73
Missouri	2	54
Kansas	2	13
Total	6	140
South Atlantic:		
Maryland	1	91
Washington D.C.	3	49
Virginia	1	1
N. Carolina	2	17
Florida	1	5
Total	8	163
E. South Central:		
Tennessee	2	19
Alabama	1	4
Total	3	23
W. South Central:		
Oklahoma	1	9
Texas	3	139
Total	4	148
Mountain:		
Colorado	1	1
Arizona	1	25
Total	2	26
Pacific:		
Washington	2	31
California	6	147
Hawaii	1	44
Total	9	222

Total Number of Libraries: 55

Total Number of Volumes: 1,514,000

Source: (14, 2)

Others are quite small and most likely came into being only because of the almost total absence of other medical library resources in the particular area.

Little is known about public health libraries, except those which are part of an academic institution, and are included in medical school library statistics. In 1955 Herman surveyed state-level public health libraries serving state boards of health and similar agencies. (16). She found that eight states were without such libraries at the time, and four of these had plans to institute library service. Other states' public health libraries ranged from very small to small; only four had collections of over 15,000 volumes. The average number of volumes held was 4,000. Nine of these did not serve the general public, all others extended service to anyone with a "valid reason for borrowing." Suitable materials for the layman were considered an important part of the collection, with loans made at the discretion of the librarian.

Although the influx of federal funds into the various state-level public health agencies has undoubtedly resulted in substantial improvement of their library collections, it is unlikely that most of them are adequate for any serious needs of practicing physicians, much less for research workers.

The Veterans Administration maintains 175 libraries in its hospitals, each one of which serves staff needs in research, patient care, education and in-service training, and includes a patients' library. In addition, there is a general medical reference library in Washington, which supplies materials from its collection to the VA hospital libraries, and furnishes them with numerous services. The total number of volumes held by VA hospital libraries and the reference library in Washington was 2,088,924 in 1966 (33), of which 394,919 were bound periodical volumes. One-thousand, five-hundred and six serial titles were received at that time by all libraries.

Because of the wide distribution of VA hospitals throughout the country and the considerable number of volumes held by them, these libraries can provide services to areas otherwise poorly served. Their collections, to some degree standardized by the issuance of a recommended list of books for VA libraries from the general reference library in Washington, are not large but do support the needs of the local staff. Supporting material can be requested from the headquarters library when needed (46). Table IX shows location of VA hospitals throughout the United States.

Nursing library literature was surveyed by Pings in 1964 (37). He found that nursing school libraries have been slow to develop because of the equally slow development of truly professional nursing education. Standards were established as early as 1942, but it was not until 1949 that a first attempt was made at evaluation of these libraries. Even in 1963, the chief criteria for evaluation was whether or not nursing school libraries were meeting local needs, a highly subjective method. A number of surveys have been made, the most recent one in 1962. It showed that of 728 nursing schools reporting,

TABLE IX

NUMBER AND LOCATION OF VETERANS ADMINISTRATION HOSPITALS, BY STATE AND CENSUS REGION

New England:

Maine	1
New Hampshire	1
Vermont	1
Massachusetts	6
Rhode Island	3
Connecticut	2
Total	14

Middle Atlantic:

New York	14
New Jersey	2
Pennsylvania	11
Total	27

E. North Central:

Ohio	5
Indiana	4
Illinois	6
Michigan	5
Wisconsin	3
Total	23

W. North Central:

Minnesota	3
Iowa	3
Missouri	4
North Dakota	1
South Dakota	3
Nebraska	3
Kansas	3
Total	20

Pacific:

Washington	6
Oregon	3
California	9
Alaska	-
Hawaii	-
Total	18

South Atlantic:

Delaware	1
Maryland	4
District of Columbia	1
Virginia	4
West Virginia	5
North Carolina	5
South Carolina	3
Georgia	3
Florida	3
Total	29

E. South Central:

Kentucky	3
Tennessee	4
Alabama	4
Mississippi	2
Total	12

W. South Central:

Arkansas	2
Louisiana	3
Oklahoma	3
Texas	10
Total	18

Mountain:

Montana	2
Idaho	1
Wyoming	2
Colorado	3
New Mexico	1
Arizona	3
Utah	1
Nevada	1
Total	14

Grand Total	175

Source: (47)

692 had libraries, most of them holding between 500 and 3,000 volumes. An average of between ten and twenty-five periodical titles were held, and 392 libraries were staffed by full-time personnel, while the remaining number had part-time attendants.

Pings also found that only a relatively small number were supported and staffed with anything approaching adequacy. Many nursing school libraries are, of course, integrated with other health sciences libraries, when the school of nursing is located adjacent to a medical school or other training facility. This seems to offer the best solution to most of the problems encountered by nursing school libraries, since medical materials are freely available to nursing students from the general collection. However, many nursing schools are located away from medical schools and similar institutions, and have no access to their collections. Many of their problems are the same as those of hospital libraries in isolated areas; both are poorly supported and offer inadequate services as a rule.

Standards, as revised in 1952, seem unrealistic; figures for collection, requirements for the training of librarians, and services outlined are all very high. Such standards cannot help but discourage administrators in the smaller, most isolated schools, which cannot, even with the utmost effort, hope to achieve anything like that which is required. Here, as in the case of hospital libraries, graduated standards seem to be a possible solution; size and program of the various schools varies so widely that the necessity of achieving the same standards for all nursing school libraries seems questionable.

Degree-granting institutions should perhaps be in an entirely different category from diploma schools, but they are not, at the present time. Other possible solutions, such as firm cooperative arrangements with medical school libraries, will be discussed later.

Figures for several other categories of health sciences libraries are included in the "academic" category and will not be discussed separately here. It should be stated that, with a few exceptions, dental, veterinary, pharmacy, and osteopathic collections tend to be small; wherever these schools are located in areas with strong health sciences collections, this does not present a serious problem, but in some cases these schools are in cities and towns far removed from other library resources and it is difficult to see how a good teaching program can be carried out with such inadequate resources to support it.

Little data has been collected on biomedical collections in academic general libraries, large public libraries, and special libraries. In order to obtain a satisfactory picture of total resources available, this information should be gathered along with data on availability of these materials to other than their own clientele, so that future planning may be based on facts rather than estimates.

No mention has been made in the preceding pages of library materials other than books and journals. There is little evidence as yet that medical libraries have taken advantage of the availability of materials in microform. This is especially surprising because of the chronic need for space so frequently mentioned by librarians as their greatest need. Statistics on microforms owned by health sciences libraries in 1966 show a wide spread (24); while one small medical-dental library (31,000 vols.) owns 6,750 units of microforms, the country's largest medical school library owns twelve, and many others none at all. "Number of reels of microfilm owned" shows the same variation; a small pharmacy library owns over 2,000, while no medical school library owns more than 300 reels.[1] This may be in part because suitable material is not available in microfilmed form; however, a brief examination of the University Microfilms catalog of available microfilm shows that 572 titles are listed under medicine and allied sciences. A more likely reason is the reluctance of many librarians to dispose of bound volumes in favor of microfilm; they represent a substantial investment of library funds, and the crowded shelves offer convincing proof of the need for a new library building. The solution which other types of libraries have found practical, that of subscribing to the hard-copy journal and microfilm at the same time, not binding, and disposing of the journal when the microfilm is distributed one or two years later, has apparently not been adopted by medical libraries, although numerous studies have shown that in medicine, as in other scientific and technical libraries, the need for material is heaviest during the first two or three years after publication and drops sharply after that (22, 18). User reluctance is, of course, another factor to be considered, but other types of libraries have found that when confronted with microfilm as the only choice, most users quickly adapt to this form of publication, especially since reader-printers are available widely, and make satisfactory copies. There is no question that the perennial lack of space and the proliferation of printed material, heavily used when first published, and seldom after that, will compel medical librarians to accept microforms as the only way to keep reasonably complete collections available within budgetary and space limits. Microforms fit into a very small space, can be used easily by patrons with minimum instruction, and allow the librarian to reduce expenditures for binding sharply. (11)

---

[1] The University of Puerto Rico Medical Center owns 437 but has not been included in the data presented in this report.

Another type of material often discussed in medical library literature is that of the general category of "audio-visual" materials. In this category are included such items as films, videotapes, audio tapes, slides, filmstrips, recordings, pictures and illustrations, and the like. Little data is available on how many libraries house such materials, but there seems to be general agreement that they should.[1] Along with this often goes the responsibility of housing and maintaining the apparatus necessary to utilize this type of material, and employing personnel trained in the maintenance and upkeep of machinery and materials. It would be interesting to ascertain to what extent audio-visual materials are presently being held, how many libraries also house equipment, and what acquisition, maintenance, and service responsibilities have been assigned.

Little is known about the acquisition and maintenance of government document and technical report collections in health science libraries. From the absence of discussion of this type of material in the literature, it may be assumed that at present, holdings are small. This seems the more surprising when the breadth of research covered in government publications is considered. A cursory examination of the chief index to the report literature, Government-Wide Index to Research and Development Reports, reveals much valuable material published in this form. The Clearinghouse for Federal Scientific and Technical Information has been successful in bringing the literature under control and distributing it rapidly, either in hard copy or microform. Specialized current awareness tools are available from CFSTI and could be most helpful in keeping physicians and researchers abreast of current developments. Such tools are repeatedly and emphatically demanded by those concerned with information needs of the biomedical community. It is possible that medical librarians might find the handling of this report literature difficult, but recent developments in coordinating COSATI cataloging standards with the Anglo-American Cataloging Rules should make this material far easier to handle.[1]

---

[1] In the Yast and Giesler Survey of hospital libraries we find the only hard data: 17.1% of all libraries held tapes, (we assume this to mean audio recording tapes), and 6.7% held films and film slide. Almost none had microfilms or readers.

Government documents, such as the publications by the U.S. Public Health Service and of the World Health Organization should, of course, be comprehensively collected by all health science libraries of any size at all. Whether this is done, and to what extent, could not be ascertained.

---

[1] Since this report was written, the National Library of Medicine has announced the inclusion of technical reports, cataloged according to COSATI standards, in Current Catalog, eliminating most of the problems of acquiring and processing this material for medical libraries.

Summary.

In the preceding pages, we have surveyed health science library collections in all types of institutions, insofar as standards and data were available. We find that resources are unevenly distributed throughout the country, with numerous libraries and rich holdings in the largest metropolitan centers and adjacent states, while the more rural areas are poor or entirely devoid of biomedical library resources. Even in the "rich" areas, we find that few libraries measure up to standards; in order to achieve such standards, vast, and probably unrealistic, amounts of money must be spent. There is the possibility that standards may be unattainably high for some types of institutions, and a graduated type of standards is suggested, taking into consideration size and mission of a particular institution as well as its location in relationship to others with similar missions, and therefore similar library collections.

Facilities have been and are limited; most libraries have outgrown their quarters and only a few have been built in the past ten years. The advent of federal assistance for medical library construction should mean substantial improvement in this area, but will by no means solve the problem entirely.

Collections consist primarily of journals and books, with rapid growth evident in the medium-sized library. Because of the incredible proliferation of publications in the health sciences field, libraries are hard put to try to keep up with current materials; just to maintain the status quo is difficult. Little attempt is evident that newer forms of informational materials are being acquired; and there is little mention of government publications and audio-visual materials as being systematically and comprehensively collected.

With limited facilities, and limited collections in most of the libraries surveyed, new ways of improving the situation will need to be found. Some of these are discussed later in this report.

Personnel:

Professional personnel in health sciences libraries is in short supply, is paid less well than other comparable categories of librarians, and is not, as a rule, suitably trained for the job.

There were about 3,000 professionally trained librarians in the 6,400 libraries surveyed by the President's Report on Heart, Cancer and Stroke (45). At that time only ten accredited library schools offered courses in the medical library field, graduating about 100 persons annually. Sixty of these were already employed in medical libraries. This left forty new librarians per year to go into the field, while the annual attrition rate alone was 150. The annual deficit thus amounted to 110 librarians, only to maintain present services. Not considered were demands for personnel created by new libraries and the expansion of existing ones.[1]

Even though there is a serious shortage, this has not meant that librarians are well-paid for their much sought-after services. They rank low in the hierarchy of their respective institutions; few have faculty status, and even if they do, their salaries are rarely comparable to their fellow faculty members, or other equivalents.

Data collected in 1964/65 reveal that medical school library salaries ranged from a high of $19,500 for a chief librarian to a low of $3,960 for a professional assistant (24). Median salary for chief librarians was $10,700, while the median highest professional salary paid amounted to $7,700, and the lowest (median) was $6,000.

---

[1] No current information on academic background of practicing medical librarians is available.

The Special Libraries Association conducted a salary survey in 1967, two years after the survey by the Medical Library Association, and found that only 7.5 per cent of special librarians working in academic institutions earned less than $6,499, with the median for this group being $8,806, and 9.1 per cent of academic special librarians earning more than $14,000 (43). Although an annual salary increase is usual in all fields of librarianship, and the data are therefore not strictly comparable, the difference is striking; medical librarians are generally on a much lower scale than their subject department colleagues in academic institutions.

TABLE X

SALARIES OF HEALTH SCIENCES LIBRARIANS, BY CATEGORY, 1964/65

CATEGORY	No. of Inst.* REPORTING	LOWEST	FIRST QUARTILE	MEDIAN	THIRD QUARTILE	HIGHEST
Head Librarian	53	6,000	8,350	10,700	13,380	19,500
Highest Prof. Salary, not Chief Lbn.	60	5,500	6,500	7,700	9,000	13,500
Lowest Prof. Salary	47	3,960	5,000	6,000	6,500	8,000

* When only one additional professional salary besides that of the chief librarian was listed, it is included here.

Source: (24) Many institutions withheld information on the salary of their chief librarian, and several on other salaries.

A number of speculations are possible as to why this is so. Medical librarians have suffered from isolation far too long; generally, they are not in the mainstream of librarianship. They belong to their own association, and do not, with a few notable exceptions, take part in the affairs of the more general library organizations. Being in charge of small collections for the most part, they are just now faced with problems that other kinds of libraries, larger, and more complex, have had to solve some time ago. The medical profession has been self-sufficient in their use of medical informational materials in the past, and has demanded and received little in the way of in-depth reference service from their libraries; thus the librarians were left with housekeeping tasks to occupy their time. Too, they have considered themselves rather apart from general library problems because of their specialized collections, although other types of special libraries have many of the same problems. Pings states this succinctly when he writes:

> "...as long as librarians persist with the myth that their institutions and their clientele are unique, they will never find the means to report their services...all medical libraries are striving to provide access to the same scholarly record, ...although we might become indignant if the techniques required for a blood transfusion were performed badly...we, for some reason or another, accept unevenness in medical library service...the good old days of arbitrary decision and shoddy technique will have to be modified." (35)

As stated above, most medical libraries contain books and journals, with little in the way of the many other information materials available to their patrons. The collections are classified in many different ways, although the National Library of Medicine has provided centralized bibliographic services since the forties. Their services, (which will be discussed in some detail later), are traditional, passive, and rarely in-depth. Little wonder then that librarians are not recognized by their colleagues as equals. The provision of instruction in the use of the library is part of their responsibility; when a librarian has faculty status this is sometimes called a course in Medical Bibliography, but to judge from the writings by physicians and research personnel, this activity has been insufficient to do the job which needs to be done in order to create an awareness of the amount of materials available, the bibliographic tools, which control them, and the techniques to use them. (44, 29) Although the Medical Library Association has carried on one-day seminars and workshops at their annual meetings, this is insufficient to provide the training needed. By no means all medical librarians belong to the association or go to the meetings, and one day per year is a limited time to teach new concepts. Too, there have not been enough library schools in the past which offered medical library courses; with the advent of federal assistance, this picture is rapidly changing, and substantial scholarships and fellowships are now being made available for working librarians to upgrade their training in a larger number of schools. Since most medical librarians are in the female category and often cannot leave to attend these courses, some other way must be found to upgrade their training if they are to do the jobs that are now expected of them. Too, more young people must be found who are willing to go into medical librarianship, which means that higher, or at least competitive salaries will have to be offered everywhere in medical libraries.

The chief reason that present medical librarians have not become full-fledged partners of their colleagues is, in the opinion of this writer, their lack of subject training. Increasingly, other types of libraries have found that subject background is needed for subject department work. This would seem to be equally true in medicine, a highly complex field indeed. Only when librarians receive, as part of their library training, courses in medical subjects similar to those given to nursing students, will they be able to speak the same language as their patrons, and serve their information needs more competently. They should be able to teach medical bibliography courses on a level with their colleagues and be able to engage in more meaningful research on information problems, knowing their patrons' information needs from a user's experience rather than a librarian's viewpoint only.

This additional training is considered necessary because biomedical practitioners and researchers are clamoring for more, better, and more in-depth information services from their librarians. (5, 31, 6, 48) Traditional methods can no longer do the job and new ones must be accepted or devised. Much can be learned by medical librarians from other types of special librarians, who are now giving this type of service, provided there is created a climate of acceptance within the medical librarian group. It is evident that unless there is substantial improvement in the quality of professional library staff, medical libraries as such will soon cease to exist, and will be absorbed by biomedical information centers, which will offer the aggressive services, custom-tailored collections, and staff expertise now so loudly demanded by the biomedical community.

It should be stated clearly that the medical library profession contains a number of outstanding librarians, with vision, imagination, and high professional competence second to none. They are in a position of leadership in the Association, and have been instrumental in instituting annual refresher courses and certification requirements for medical librarians, establishing guidelines for medical libraries, and providing a statistical base for the improvement of collections and services. It is interesting to note that their academic background often includes a doctorate in medicine or the biomedical sciences. However, their work on the national level has apparently had little impact on the small library and its librarian, who continues to do what she has always done.

Hospital librarians do not, for the most part, have suitable academic background for their work. Yast and Giesler (50) found that of 609 head librarians (full time) employed in 3,192 hospitals, 198 had undergraduate degrees, less than half with majors in library science, while only 128 had graduate degrees (112 in library science). There were 190 librarians, who reported "some college", and eighty-seven with high school diplomas only. Of the 1,227 part-time librarians, 248 had high school diplomas, 463 "some college", 299 had undergraduate degrees and 141 had graduate degrees. Library science was specified as major by 151 undergraduates and seventy-eight graduate degree holders. No information is available on salaries but they may be assumed to be lower than those paid to medical school librarians.

Budgetary Support.

Many of the problems enumerated above are caused by insufficient support of health science libraries. While institutional budgets and especially the amounts expended for research have increased tremendously, library support lags far behind and is, in fact, losing ground. Deitrick and Berson state this succinctly:

> "The demands placed upon the libraries by research projects have not been recognized by the administrative officers of medical schools or by agencies granting funds to support such projects. It is estimated that, in 1950/51, the allocation to libraries of 2 percent of the funds restricted to research would have resulted in an average increase of approximately 40 percent...In a nation dependent upon medical research to a greater degree than ever before surprisingly little is being expended on the housing of the reports of that research and on making those reports available." (10)

Bloomquist finds the situation unchanged in 1962, and shows the median ratio of institutional expenditure to library expenditure to be 1.7.

The Heart, Cancer and Stroke Report points up dramatically how the nation's health programs and activities have grown. Total public and private expenditures for health and medical services stood at $28.8 Billion in 1963, as compared to $7.5 Billion in 1945. Federal expenditure for medical research was $27 Million in 1947 and over one Billion in 1964. (45)

Table XI compares Bloomquist's library expenditure figures with those of 1964/65, showing considerable increases in all libraries. Because a much larger number of libraries reported in 1964/65 than did in earlier survey, the figures are not strictly comparable; it is believed that Bloomquist included only medical school libraries, while the later statistics include all academic health sciences libraries.

TABLE XI

DISTRIBUTION OF HEALTH SCIENCES LIBRARY EXPENDITURES, 1960/61 and 1964/65

ITEM	NUMBER OF INSTITUTIONS	MAXIMUM	THIRD QUARTILE	MEDIAN	FIRST QUARTILE	MINIMUM
Expenditures 1961/62	74	259,374	94,532	51,882	20,247	9,476
Expenditures 1964/65	126	505,345	119,395	67,354	24,326	4,290

Sources: (4, 24)

It should be noted that in 1964/65 almost the entire first quartile consists of pharmacy and dental school libraries, while most medical libraries rank above the median.

Table XII presents health science school library expenditures by Census Region and State, showing once again the wide differences between "rich" and "poor" regions.

No set figure can be accepted as sufficient for the support of a given library, or different types of libraries, since needs and demands made upon them vary widely. Over the years, various recommendations have been made. Bloomquist quotes Deitrick and Berson as recommending 2 per cent of the total institutional budget; the American Library Association recommends 5 per cent for academic library support and a New York Department of Education study states that $50 per undergraduate and $500 per graduate student be allocated for reasonably adequate support (4). Medical libraries do not begin to approach even the smallest of these amounts. Table XIII shows four of the best-supported states for which reasonably complete figures for all

TABLE XII

FINANCIAL SUPPORT OF HEALTH SCIENCE SCHOOL LIBRARIES, 1964/65, BY CENSUS REGION AND STATE

INSTITUTION	NO.	LIBRARY SUPPORT
New England:		
N.H.	1	$ 127,822
Vt.	1	82,200
Mass.	4	544,540
Conn.	2	237,143
	8	991,705
Middle Atlantic:		
N.Y.	11	1,131,854
N.J.	3	212,230
Penn.	10	559,665
	24	1,903,549
E. North Central:		
Ohio	5	338,183
Ind.	3	164,466
Ill.	5	449,020
Mich.	7	490,795
Wisc.	3	220,675
	23	1,663,139
W. North Central:		
Minn.	1	184,273
Iowa	4	67,967
Mo.	8	367,441
N.D.	1	36,544
S.D.	1	25,247
Neb.	3	137,508
Kan.	1	119,021
	19	938,001
South Atlantic:		
Md.	2	475,191
D.C.	4	203,634
Va.	2	199,694
N. Car.	3	325,382
S. Car.	1	38,462
South Atlantic: (continued)		
Ga.	3	$ 113,984
Fla.	3	234,642
W. Va.	1	94,413
	19	1,685,802
E. South Central:		
Ky.	4	263,089
Tenn.	3	224,874
Ala.	2	151,578
Miss.	1	102,612
	10	742,153
W. South Central:		
Ark.	1	94,931
La.	2	185,691
Okla.	2	70,795
Tex.	7	252,124
	12	603,541
Mountain:		
Colo.	1	165,956
N. Mex.	1	119,395
Utah	1	76,550
	3	361,901
Pacific:		
Wash.	1	206,416
Ore.	2	140,810
Cal.	8	1,315,265
	11	1,662,491

Total: $10,552,282
Total: 129 libraries

Source: (24)

three categories were available, giving library support as a percentage of institutional budget and research funds expended. New York, with 1.8 per cent of institutional funds going to the library, leads the list; the others support their libraries at a smaller rate.

TABLE XIII

RELATIONSHIP OF TOTAL INSTITUTIONAL EXPENDITURE AND RESEARCH FUNDS TO LIBRARY SUPPORT, FOUR SELECTED STATES, 1964/65

STATE	LIBRARY SUPPORT	INSTITUTIONAL SUPPORT	RATIO*	RESEARCH FUNDS	RATIO**
California	1,315,245	77,890,502	1.1	12,557,125	3.1
Massachusetts	544,540	32,616,181	1.7	16,686,662	3.2
Michigan	322,186	20,187,066	1.6	11,931,120	2.7
New York	817,161	45,616,697	1.8	29,083,306	2.8

*Ratio: Library operating expenditure as percentage of total institutional expenditure

**Ratio: Library expenditure as percentage of research funds granted to parent institution

Source: (24)

Most of the above figures pertain to medical school libraries and other academic libraries in the health sciences. Little is known about the support of other types such as those in hospitals, nursing schools and so forth. However, to judge from the status of collection, staff, and facilities, support is not likely to be sufficient. Standards for these types of libraries are extremely vague, in most cases specifying only that support should be "adequate".

It is interesting to note that the Guidelines recommend program budgeting for medical school libraries, rather than a specific amount, or a percentage of the institutional budget. It would be useful to know how many librarians are using this technique and how successful it is in helping them to overcome budgetary problems. It is this writer's impression that this much-recommended technique is little-used in academic libraries, as opposed to a number of public libraries which have been using it for years, and with great success. The use of program budgeting presupposes an understanding of this technique on the part of administrations, of course; it is not known to what extent academic institutions are using this method.

One recommendation which has been made over the years, apparently with little success, is to set aside a percentage of research funds for library support. As early as 1958, Darling surveyed medical libraries (9) and found that twenty out of forty-five libraries did indeed receive a percentage of grant funds, ranging from $200 to $16,825. Five libraries received a percentage of each grant from overhead allowances. However, librarians reported that their administrations had, in some cases, cut their institutional library budgets when grant funds were received, and that they found the complex reporting requirements to be burdensome. Some felt that grantees who allocated part of their funds to the library were prone to interfere in library policy. Darling concludes that in some schools, where many grants were received but none went to the library, "one can only conclude that departmental libraries flourished at the expense of the general medical library." Postell comments on Darling's survey and supports it with his own library's data (41): while grant funds received by his parent institution had increased 5,900 per cent between 1946 and 1956, his library's budget increased only 114 per cent. He recommends that if libraries receive grant funds, these should be spent for the purchase of the unusual item, not become part of day-to-day library operational expenditure.

Canadian librarians surveyed their medical libraries in 1962 and recommended the establishment of a national medical bibliographic center and the setting aside of "a percentage of all medical research grants from federal agencies to libraries in order to alleviate the strain imposed by the research program." (7) Another recommendation with considerable merit is that federal sources should make per capita grants for Ph.D. candidates, a percentage of which would go to the candidates' libraries.

Both Bloomquist and Orr recommend that a set percentage of research grants be allocated to libraries routinely. (4, 6)

It is clear that if such a method of financing were chosen, those libraries whose institutions receive research grants would be assured some means of compensation for the additional demands made upon them by researchers. However, there would have to be adequate safeguards written into regulations governing grants so that library budgets could not be reduced, and, in fact, would have to be increased annually in order that the library might be eligible for grant funds. This increase could be based on budget increases the library received for a specified number of years past.

Although this would by no means solve all budgetary problems, it would go a long way toward insuring that the library budget reflect increases in the research budget.

Institutions which do not receive research grants do not, of course, have this avenue open to them. Until the demand for hospital library service, for example, becomes strong enough to put considerable pressure on hospital administrators, there is little hope that the situation will improve. In a later chapter, some possible ways in which some of the problems of these types of institutions might be solved will be discussed.

With the passage of the Medical Library Assistance Act in 1965, financial aid to health science libraries became a federal responsibility. Grants are available for improvement of services and collections, as well as for the construction of new facilities. Since the law has been in effect, medical libraries have received grants ranging from $1,500 to $63,000 (28). In future years, the impact of this program will become stronger, as more libraries receive grants and as the amount of the grants is increased. However, the demands of the Vietnam War on the federal budget inject a degree of uncertainty into this program; as they increase, domestic spending will undoubtedly be cut, and libraries will feel this reduction along with all other agencies.

Services:

> "The purpose of the medical library is service to its community."[1]

> "The health sciences library will probably have to adopt an entirely new philosophy in the area of service...such service will become active in character rather than passive as has been typical in the past..."[2]

Thus the two major guides define what is, or should be, the raison d'etre for any library (13, 15). Standards for all types of health science libraries are impressive when enumerating services. A partial list of suggested services is given below; most likely there are others which have not come to this writer's attention:[3]

1. Document delivery:
    - Obtaining from closed shelves, for user
    - Delivering to circulation desk for pickup by user
    - Delivering to user's department or desk
    - Delivering to user's assigned carrel
    - Mailing to user outside institution
    - Accepting mail request and delivering document
    - Accepting telephone request and delivering document
    - Reserving document in circulation for user
    - Circulating uncataloged document
    - Circulating photocopy in lieu of restricted document
    - Renewal of document for additional loan period
    - Providing after hours return for user when library is closed
    - Routing serial titles on request

2. Provision of bibliographic tools:
    - Distributing copies of catalog and serials holdings list
    - Distributing copies of continuing bibliographies produced by MEDLARS, and similar tools

3. Provision of references:
    - On specific subjects, on request, when already available in published form
    - On specific subjects, compiled in-house
    - On a continuing basis, on request
    - On specific subjects, exhaustive, critical

---

[1] p. 11

[2] p. 6

[3] Most of this list was taken from the Third IAMC Report (19), supplemented by those services listed in Guidelines and the writer's knowledge.

4. Provision of "screening aids":
    - Preparation of annotations
    - Preparations of abstracts
    - Preparation of classified lists of references

5. Provision of alerting services:
    - Maintaining "new book" shelves
    - Maintaining "current journal" shelves
    - Distributing new acquisitions list
    - Routing title pages of journals
    - Distributing "Current Contents" and similar lists
    - Maintaining interest profiles, scanning literature, routing to appropriate user or user group

6. Utilization of outside resources in providing service:
    - Referring user to outside source
    - Obtaining document from outside source
    - Initiating MEDLARS search
    - Obtaining answer or information from outside source

7. Photocopy services:
    - For library material in lieu of circulation only
    - For any library material within maximum length limits specified
    - For user's personal material
    - Free of charge
    - For a fee
    - Provided by library staff
    - Made by user himself

8. Provision of answers to specific questions:
    - Simple fact finding (directory-type questions)
    - Simple summaries (collection of "simple facts" from several sources)
    - Complex questions (conflicting facts must be compared, and contrasted)

9. Provision of state-of-the-art reviews (synthesis of all information on a given subject, produced in a coherent essay, may involve critical evaluation and translation from foreign language)

10. Teaching use of information resources:
    - Distributing library newsletter
    - Distributing library guide
    - Formal courses (lectures, seminars, programmed instruction)
    - Informal on-the-spot instruction, ranging from pointing out a specific source to teaching use of newer tools on a systematic but individual basis)

11. Aiding users in organizing or maintaining their own information systems
    - Consultation only
    - File maintenance on a continuing basis
    - Provision of binding services for users' personal collection
    - Ordering of document for personal libraries

12. Preparation of exhibits
    - On a regular basis
    - On an irregular basis
    - Historical exhibits only
    - Both current and historical exhibits
    - Exhibits prepared outside the library

13. Provision of work space for users:
    - Space provided for library-related work only
    - Space provided for legitimate user, regardless of purpose of his visit
    - Assignment of carrels to specific users
    - Assignment of seminar or other rooms to particular groups
    - Paging users in library, provision of telephone in convenient location

14. Provision of translations:
    - Quick translations only, by library staff
    - Exact translation, full-length, by library staff
    - Provision of translator locally
    - Provision of translation from elsewhere

15. Provision of non-print media and necessary equipment:
    - Acquisition of needed films, tapes, etc.
    - Borrowing or purchasing for user
    - Equipment used in library only
    - Equipment may be borrowed
    - Provision of equipment maintenance

16. Editing services:
    - Referral to editor outside the library
    - Provision of editing service by library staff
    - Punctuation, grammar, spelling, bibliographic styling only
    - Proofreading, compiling indexes, editing for clarity, brevity and accuracy, plus the above

17. Extramural services:
    - Any or all of the above to physicians and health-related personnel within a given geographic area
    - Advisory or consulting services to health sciences libraries

To this lengthy list could be added almost all other library activities. When materials are prepared for use, this constitutes a service. When in-service training to library staff is provided, it is for the purpose of better direct (public) or indirect (technical processes) service to users. When the chief librarian attends meetings and seminars, both within and outside his institution, he learns more about his immediate community of users, or about improved methods of administering his library. Thus this part of the report does, of necessity, look at the library as a whole, covering some of what has been said before, but within the context of assessing the library's service.

Although service is the most important aspect of a library's function, it has not, in the past, lent itself well to quantitative analysis, or the gathering of statistics. Thus little is available, beyond narrative descriptions, that is useful for this report.[1]

Bloomquist obtained information on library services by interviewing twelve librarians from different types of medical schools and in different geographic regions. As defined by him from the interviews, traditional services consist of the following: (4)

Circulating books and journals
Borrowing materials not owned from other libraries
Physically locating library materials
Answering short reference questions from reference books
Answering longer reference questions from the literature (limited)
Compiling short bibliographies (limited)
Verifying references (limited)
Photocopying (limited)
Circulating lists of acquisitions (limited)
Preparing displays and exhibits (limited)
Instructions on use of library (limited)

---

[1] Orr's work at the Institute for the Advancement of Medical Communication will soon provide accurate instruments for measuring several types of library service (19)

"Limited" refers to the varying degree with which that particular service is given, "depending upon the amount of time the staff has available and the training and imagination of the staff member".[1] (Italics supplied).

An additional list of services was given by his twelve librarians; it consists of activities they do not now offer but would like to, if sufficient funds were available. He continues, "very few of these services are being offered by any medical school library to any extent. By way of contrast, many of these services are offered in the libraries of pharmaceutical houses."[2]

He ascribes this to the fact that pharmaceutical company libraries are financially better supported. The list contains the following items:

Continuous bibliographies for readers wishing to be kept up to date on the literature of a particular subject

On-demand bibliographies, retrospective

Translation service, provided by library staff member (short summary) or full translation by staff member or translator located by library

Abstracts on a particular subject

Audio-visual service (library identifies and locates film or sound tape,rents or buys for user, provides equipment, personnel to run it, place to show it or listen to it. Library also maintains up-to-date collection)

Delivery service (by messenger, closed-circuit television, telefacsimile or similar methods)

Extension service (library provides document or photocopy to reader in remote area, either by mail or newer media)

Rapid copy service (photocopy is made while reader waits, using latest copying techniques for optimal reproduction)

---

[1] p. 19

[2] p. 19

Teaching the use of the literature (library provides instruction to students, faculty members, research workers, hospital house staff, etc.) Formal courses, orientation tours, occasional lectures.

Services to hospitals (serve all nearby hospitals as resource library, coordinate purchases of library materials for hospitals)

Editorial service (all papers submitted pass through library for reference verification; citations are checked for uniformity; format, grammar, illustrations are checked)

Literature assistance staff (library assigns staff member to research team for literature work)

Liaison service (library assigns staff members with subject background and bibliographic training to work with particular interest groups such as nurses, occupational therapists, medical students)

What would it cost to provide even part of the above services? Bloomquist quotes Harvard Medical Library's estimate of $49,300 for eight staff members to perform all of the above except audio-visual, delivery, extension, rapid copy, and hospital advisory services. Today, six years later, the amount would probably have to be increased considerably. Yet, it is not a large amount, considering the availability of federal funds for just such purposes, and would enhance considerably the role of the library as a service-oriented organization. It might then approach the role so succinctly outlined by Shaw, as quoted by Bloomquist:[1]

> "The front office should be designed to get the research worker *what* he needs *where* he needs it, and *in the form* in which it is most useful to him, regardless of what we have to do behind the scenes to achieve this, and regardless of how we do it. Only insofar as we achieve this objective *currently* and *continuously* can scientific information service contribute to the advancement of science." (Italics supplied).

---

[1] p. 22

What services are libraries currently giving? It is difficult at best to come up with even an approximation in the absence of standards of measurement, and hard data. When health sciences libraries were surveyed last, in 1966, no data were gathered on their services except for interlibrary loans. Only libraries of medical organizations supplied listings of services they were currently offering. (14)

They were:	Libraries
Reference and/or information service	57
Interlibrary loans	55
Circulation of library materials	54
Compilation of bibliographies on request	49
Preparation of acquisitions lists	48
Photoreproduction of materials	45
Routing of new journals	34
Issuance of a library publication on regular basis	28
Other "major service provided to library clientele"	19
Preparation of translations	11
Preparation of abstracts	10

A total of fifty-eight libraries reported their activities. It should be remembered that some of these libraries are very small; therefore it seems the more surprising to find so many activities listed for such a considerable number of libraries, especially when the activities are compared to Bloomquist's list. This list, it should be noted, was made up by twelve medical school librarians; although they are not identified, it is reasonable to assume that they came from above-average libraries with good services. Has the picture changed so rapidly in the few years since Bloomquist made his survey? Or is it possible that the libraries of medical associations and societies are more responsive to their users' demands, since they are directly supported by user fees? It is likely that the latter is true since there is little in the literature to support an assumption that medical school libraries have recently increased their services substantially.

A number of interesting speculations are possible. What if health science practitioners and researchers were assessed a library fee (students are, at the present time)? Would this result in louder demands for more and better services? Would this mean that health science school librarians would have to account for their funds more closely in terms of services rendered?

Would they, in effect, have to support with hard data that which has been considered an art thus far? Pings seems to think that this can be done and has proved that library service can be measured in a series of excellent studies, virtually the only ones available on the subject.

Pings states that Guidelines are too generalized to be used as standards or instruments of measurement. He contends that monitoring of libraries is needed, just as hospital activities are monitored in many institutions. Norms can then be evolved, based on performance, and not on absolute, and perhaps unrealistic standards. Comparative figures will become available which are valuable for measuring one institution's performance against all others. He finds that there is considerable resistance to measurement of services among librarians. (35)

In a series of studies published by his library, Pings has set out to gather facts that can be used for measurement. He studied service patterns and traffic flow in his library, reference services were measured, as were hospital library services in the Detroit area. A number of reports deal with the interlibrary loan activity; these are particularly revealing. (8, 38, 39, 40, 42)

A study of reference services at Wayne State University Medical Library, made in 1964, shows that the following kinds of questions were answered during a six-month period:

TABLE XIV

REFERENCE SERVICES BY TYPE OF QUESTION AND METHOD OF TRANSMITTAL

Accepted By	Holdings	Bibliogr. Verification	Education	Directory Information	Specific Informat.	Miscell.	Total
Telephone	344	134	10	92	288	78	949
In Person	282	37	162	15	95	56	647
Total	626	174	172	107	383	134	1,596
% of total	39.2	10.9	10.8	6.7	24	8.4	100

Source: (42)

Services were defined as limited by policy; for example, no preparation of bibliographies was offered by the Wayne State library staff. "Education" is defined as instruction in the use of the library, or particular bibliographic tools.

"Miscellaneous" includes all types of questions not defined under the other five categories; it is interesting to note that this category constitutes only 8.4 per cent of all questions. Over 90 per cent, then, fall into the "quick reference" category, with the possible exception of "education" which may include longer periods of time spent in instructing a student or a group.

Pings surveyed hospital libraries in the Detroit area to obtain some facts on the kinds of services they offered. He found that although resources were small, a wide variety of services were offered; some, he thought, consisted of efforts too ambitious for the particular institution. Interlibrary loans were heavily used to obtain needed materials; here we find evidence of the influence of Wayne State Medical Library, which has done an excellent job of informing hospital libraries in the area of its services to them, training them in the use of bibliographic tools and interlibrary loan techniques, and, in fact, being their resource library. (40) Annan finds that small hospital libraries, with untrained staff, sometimes rely too heavily on larger libraries, not only for loans but for professional services. (3)

Another study of library reference services has been made by Orr at the Institute for the Advancement of Medical Communications. (19) Two libraries, Upstate New York Medical Center and Wayne State Medical Library, are being used to test various methods for measuring library services.

A total of 235 reference questions were asked at Wayne State Medical Library during a two-week period; they fell into the following categories:

TABLE XV

CATEGORIES OF REFERENCE QUESTIONS ASKED AND PER CENT OF TOTAL

CATEGORY	NO.	PER CENT
Name and address	24	10.
Holdings	48	20.
Bibliogr. verification	28	12.
Instruction in library use	25	11.
Directional	23	10.
Library Policy	40	17.
Interlibrary loans	4	1.7
Word definitions	4	1.7
Other (undefined)	39	17.
	235	100

Source: (10)

Others in the series dealing with services in Pings' library are listed in the bibliography; this group of reports represents the only soundly supported material found in the literature and is an outstanding example of the kinds of studies needed to provide planning data for libraries.

Interlibrary loans:

In order to offer its patron access to the nation's library resources, a library must engage in interlibrary loan activity. This is the time-honored method whereby libraries borrow from and lend to each other in order to make needed materials not locally owned available to their patrons. The American Library Association formulated an Interlibrary Loan Code in 1952, which is accepted by most libraries. However, it is not explicit enough to specify what action should be taken in all cases; for example, it does not prescribe a specific method of transmitting a request nor is the method of document delivery specified. Thus we find that some libraries accept requests only on the standard ALA Interlibrary Loan Form, while others honor written requests in any form, as well as telephone requests, and oral requests by messenger sent from another library. Teletype, and to a much lesser degree the telephone have been used to transmit requests; while a number of libraries have agreed to a standard form of TWX request, others formulate their own. Some libraries send only photocopies of journal articles, while others lend the original volume. Some require refunding of postage while others do not.

Although the ALA Code specifies that the nearest library, likely to have the material, should be consulted first, many libraries send their requests to larger libraries because these are known to have what is needed.

Keenan, in a discussion of interlibrary loans during the period 1952-62, found that the National Library of Medicine was used most heavily by health science libraries in the "library-rich" states of New York, Ohio, Pennsylvania, Illinois, Texas, Florida, New Jersey and Michigan. (20) The most frequently requested journal titles were those which would be expected to be found even in small medical libraries: Lancet, British Medical Journal, American Journal of Physiology, Journal of the American Medical Association, and Journal of Biological Chemistry. One would assume that no library with any claim to providing minimum service would request titles such as these, nor would one expect most requests to come from those states with the richest biomedical library resources. A probable reason might be that until recently no agreements existed as to what type of material should be held in one's own library and what could or should be borrowed and from whom. Some of the patterns which have emerged recently will be discussed in a later chapter.

The volume of interlibrary loan activity has increased sharply in all types of libraries; in biomedical libraries Pings found an increase of 70 per cent over a period of five years. 500,000 items were loaned, at a cost of $3 Million. (36) The National Library of Medicine loaned 113,485 items during 1961-62; by 1966 this figure had increased to 151,781 (30). Pings speculates that the rate of increase will accelerate each year; chiefly because of the increased availability of bibliographic tools, and also because of the ever-broadening base of research, covering an increasingly large number of subjects. He states that document delivery must be improved sharply by establishing firm inter-institutional relationships so that users may expect prompt response to their requests.

Delays in handling requests are presently too great; the chief reason for this is that if the document is not available at the first library asked, the request procedure must be started all over again. Pings suggests that the lending library which does not have the requested item should forward the request directly to a library which is known to own it. However, this can only be done if clear definitions of responsibility are established among all borrowing and lending libraries.

More will be said about such cooperative ventures later in this report.

It is interesting to note that the installation of TWX equipment in libraries has brought about a much more rapid handling of interlibrary loan requests, especially among those libraries subscribing to standard procedures established among them. A requirement of this group is that all requests must be handled within 24 hours, and an answer sent if material is not available. We may assume that this 24-hour rule could have been established without teletype, even though sending an answer back by mail would have delayed this part of the procedure somewhat. However, by joining in a teletype "network", librarians subscribed to common rules for the first time, and the group's decision was to make the one-day handling of requests one of those rules. Before that time, librarians had no reason to form a group and thus could not, on an informal basis, make such an agreement.

Document delivery, including those not owned, (interlibrary loans), is also the subject of a study at the IAMC (19). The two test libraries (Upstate New York and Wayne State) as well as three others were asked to keep data on the availability of a carefully chosen sample of documents which might be requested from them by smaller libraries. It should be noted here that all five libraries were designated "reservoir libraries". This term, as used by IAMC, describes a library which would serve as a regional resource for other medical and hospital libraries. Table XVI, reproduced from the IAMC report, reports the availability of those documents owned by the five libraries in different time frames.

We find a very high percentage of owned documents available within a short time in all libraries; the highest percentage of documents not available within a few hours is 9.4 per cent, thus all libraries qualify as 90 per cent libraries, within the limits of document availability of titles owned. However, when we consider the total sample of 244 documents, and measure document availability against this figure, the picture changes somewhat. Wayne State, for example, owned 168 out of 244 documents (69 per cent); of those 160 were immediately available, or 65 per cent. Wayne State has a collection of 144,924 volumes.

New York Academy of Medicine owned 198 out of 244 documents, or 81 per cent; of those, 190 or 78 per cent, were immediately available. This library owns a total of 356,000 vols., or more than twice as many as Wayne State. It would be interesting to know the titles of those documents not available; most likely they were items completely out of scope of even a large biomedical library.

Another study on document availability is by Orr and Pings, published in 1964 (32). They found that reference retrieval had been

TABLE XVI

DOCUMENT DELIVERY PERFORMANCE TEST FOR RESERVOIR LIBRARIES (SAMPLE R, 244 DOCUMENTS)

Availability Category	Wayne	Upstate	Upstate Plus Buffalo**	College of Physicians	New York Academy
#1 Available within a few hours	160 (66%)	175 (72%)	198 (81%)	174 (71%)	190 (78%)
#2 Total available within a day	160 (66%)	178 (73%)	201 (82%)	176 (72%)	191 (78%)
#3 Total available within several weeks	168 (69%)	181 (74%)	204 (83%)	182 (75%)	198 (81%)
#4 Total owned *	168 (69%)	183 (75%)	206 (84%)	185 (76%)	198 (81%)

Category #1 -- documents on shelf when checked.

Category #2 -- documents in Category #1 plus those stored off premises but retrievable within one work day plus those in use within library when checked but back on shelf when rechecked next day.

Category #3 -- documents in category #2 plus those on loan when checked.

* The difference between the values in Category #3 and #4 is attributable to documents that could not be "located" on either the first or second search plus those the library had declared "missing".

** Upstate and Buffal o are connected by teletype; when a document is not immediately available at one of the two institutions, the request is teletyped to the other. If the other library has the document and can make it available it is immediately sent.

Source: 19

vastly improved by MEDLARS, the services of the Institute for Scientific Information (Science Citation Index) and similar tools, but that document retrieval had become increasingly difficult because of the heavy demands created by increased bibliographic retrieval instruments. The burden of document provision had fallen on the larger medical libraries, which loaned five volumes for every one they borrowed, and whose interlibrary loan activity had increased 10 per cent each year. While MEDLARS had increased its coverage from 2,200 journals to 3,500 journals, it was found that only three libraries besides the National Library of Medicine owned as many as 2,200 journals at that time, (in 1966, BMLA statistics list eleven libraries as holding more than 2,200 journals, while four had more than 3,500). The financial demands made on these large libraries by the inter-library loan activity was found to be prohibitive, and subsidization was suggested as a short-term solution while long-range plans should include increased capacity of the National Library of Medicine to handle such loans, establishment of regional resource libraries, and increased self-sufficiency of local libraries.

The passage of the Medical Library Assistance Act in 1965 (1) provided financial assistance for all three activities and the effects should be felt within the next few years. However, the mere provision of funds will not substantially improve the situation, unless agreements are made between different kinds of libraries on what their document provision responsibilities are to be.

Little data is available on other kinds of services offered, besides lists in the various guides and standards. The impression is strong that the "traditional" services, listed above, are those given by most medical libraries. There are very possibly exceptions to this; how many there are is not know. It would be extremely valuable to survey libraries so that sufficient facts may come to light that could supply a sound base for further planning. More suggestions as to how this may be accomplished are given in a later chapter.

Summary.

An examination of services given by medical libraries reveals that they consist of circulating books and journals, obtaining materials not owned on interlibrary loan, answering short reference questions (facts, bibliographic verification, use of library tools, information about holdings), and, to a limited extent, answering long reference questions, preparing bibliographies, providing photocopy services, circulating acquisitions lists, and preparing exhibits. Instruction in the use of the library is given, ranging from limited to extensive.

The services enumerated above may be categorized as "passive", that is, they are stimulated by requests from users. Exceptions are the circulation of acquisitions lists, which are usually distributed without specific request from a user, and the preparation of exhibits.

Many other services are considered desirable; they are specified in the various standards as well as enumerated by librarians in the literature. There exists no clear definition as to what services a library ought to offer, although there are many exhortations that services must become more aggressive, encompassing most of the activities now performed by other types of special libraries and information centers. Lack of funds is the most commonly-stated reason for not offering more services, although it might be questioned as the sole reason. Without a doubt, lack of trained personnel to perform the more specialized functions required in an aggressive information service is an important reason, while another might be the reluctance of librarians, overworked, and understaffed, to embark on new ventures, which would, above all, require a change in the basic philosophy of service, much study and training, and quite likely a small revolution behind the scenes.

It may, of course, be questioned whether a library ought to perform the additional services outlined in this chapter. It is possible that with available staff, trained in traditional library work, such a basic change cannot be made. However, it should be clearly stated that the medical library as it functions today is simply not the mechanism needed for bringing information to its users in the way and form in which it is needed. If libraries expect to become better-supported, if they are to take a vital place in the national information system, then they must become aggressive, advertise their wares, and follow up on the demands created by such advertising. This can be done in several ways, and will be discussed more fully in a later chapter.

LIST OF REFERENCES CITED

1. An Act To Amend the Public Health Service Act to Provide for a Program of Grants to Assist in Meeting the Need for Adequate Medical Library Services and Facilities. Public Law 89-291, 89th Congress, S.597, October 22, 1965. College and University Reports, CCH Special 77.

2. American Library Directory, R. R. Bowker, 1967.

3. Annan, Gertrude L.
Medical Librarianship in the United States: Resources and Trends. Bulletin of the Medical Library Association 50:149-158 (1962).

4. Bloomquist, Harold
The Status and Needs of Medical School Libraries in the United States; a report prepared for the National Library of Medicine. Boston, October 1962. 30p.

5. Campbell, James A.
The Library's Impact on Medical Education. Bulletin of the Medical Library Association 41:7-11 (1953).

6. Communication problems in biomedical research; a report of a study. Federation Proceedings. 23:117-1176 (1964).

7. Canadian Library Association
A Brief Presented to the Royal Commission on Health Services by the Committee on Medical Science Libraries. Ottawa, April 1962. 16p.

8. Cruzat, Gwendolyn S. and Vern M. Pings
An Evaluation of the Interlibrary Loan Service, Wayne State University Medical Library. III. Determination of Cost for Processing Interlibrary Loans. Detroit, Wayne State University School of Medicine Library and Biomedical Information Service Center, November 1966. 31p. (Rep. No. 17).

9. Darling, Louise
Summary of Information in Questionnaires on Grant Aid to Medical School Libraries. Bulletin of the Medical Library Association 46:191-193 (1958).

10. Deitrick, J. E. and Berson, R. C.
Medical schools in the United States at Mid-Century. McGraw-Hill, 1953.

11. The Economics of Periodical Storage, in Modern Periodicals on Microfilm (catalog). Ann Arbor, Michigan, University Microfilms, n.d. p. 61-62.

12. Giesler, R. H. and Yast, H. T.
A Survey of Current Hospital Library Resources. Hospitals 38:55-57 (1964).

13. Guidelines for Medical School Libraries. Journal of Medical Education 40, pt. I:1-61 (1965).

14. Health Science Libraries of National, State and Local Medical Organizations. Bulletin of the Medical Library Association 55:191-200 (1967).

15. The Health Sciences Library; its Role in Education for the Health Professions. Report of the Library Study Committee of the Association of American Medical Colleges to the National Library of Medicine. Journal of Medical Education 42: pt. 2 (1967) Entire issue.

16. Herman, Flora E.
The Public Health Library; symposium on types of medical libraries, pt. VIII. Bulletin of the Medical Library Association 43:212-216 (1955).

17. Herner and Company
A Recommended Design for the United States Medical Library and Information System, v.I and II. rev. ed. Washington, 1966. (NSF-C-442, PB172 924, v.2).

18. Hyman, Richard J.
Medical Interlibrary Loan Patterns. Bulletin of the Medical Library Association 53:215-224 (1965).

19. Institute for Advancement of Medical Communication
Third Progress Report, covering period 4/1/67-7/31/67. Contract PH43-66-540. Philadelphia, August 14, 1967. (Privileged Communication, not to be released without the Institute's authorization).

20. Keenan, Elizabeth L.
Interlibrary Loan, 1952-62: ten years of progress? Bulletin of the Medical Library Association 52:307-315 (1964).

21. Keenan, Elizabeth L.
Medical School Library Statistics. Bulletin of the Medical Library Association 52:386-409 (1964).

22. Kilgour, Frederick G.
Use of medical and biological journals in the Yale Medical Library, pt. I and II. Bulletin of the Medical Library Association 50:429-499 (1962).

23. Kruzas, A. T.
Directory of Special Libraries and Information Centers. 1st ed. Gale, 1963.

24. Library Statistics of Schools in the Health Sciences, Pt. I. Bulletin of the Medical Library Association 54:206-229 (1966).

..., Pt. II. Bulletin of the Medical Library Association 55: 201-202 (1967).

25. Marshall, Mary Louise
Library Standards; A Symposium. Bulletin of the Medical Library Association 51:63-87 (1963).

26. Medical Library Association. Hospital Group
Objectives and Standards for Hospital Medical Libraries. Bulletin of the Medical Library Association 40:384-387 (1952).

27. Medical Library Association. Hospital Group
Objectives and Standards for Nursing School Libraries. Bulletin of the Medical Library Association 40:394-397 (1952).

28. Medical Library Resource Grants. Bulletin of the Medical Library Association 55:527-532 (1967).

29. Murtaugh, J. S.
Communication in the biomedical sciences. Journal of Medical Education 37:1169-82 (1962).

30. National Library of Medicine
Annual Report, 1966.

31. Newill, Vaun A.
Report of Research and Development of Medical Information Retrieval Projects. Cleveland, 1962. 14p. (Paper presented at the Rochester Conference on Data Acquisition and Processing in Biology and Medicine).

32. Orr, Richard H. and Vern M. Pings
Document Retrieval; the national biomedical library system and interlibrary loans. Federation Proceedings 23:1155-1163 (1964).

33. Personal Communication from *Mr. Henry J. Gartland*, Director, Library Service Veterans Administration, Washington, dated August 24, 1967, and including statistics collected for the Federal Library Committee as of December 1966.

34. Not used.

35. Pings, Vern M.
Can Libraries be Monitored? (Communications to the Editor). *Bulletin of the Medical Library Association* 54:161 (1966).

36. Pings, Vern M.
The Interlibrary Loan Transaction. *Bulletin of the Medical Library Association* 53:204-214 (1965).

37. Pings, Vern M.
Nursing Libraries; a review of the literature, 1900-1963. Wayne State University School of Medicine Library and Biomedical Information Center. October 1964 (Report No. 6).

38. Pings, Vern M.
Study of Interlibrary Loan Policies of Midwest Biomedical Libraries. Detroit, Wayne State University School of Medicine Library and Biomedical Information Service Center, September 1965. 13p. (Report No. 15).

39. Pings, Vern M. and Fanny Anderson
A study of the Use of Wayne State University Medical Library, pt. 1. Detroit, Wayne State University School of Medicine Library and Biomedical Information Service Center, May 1965. 36p. (Report No. 10).

40. Pings, Vern M.
Test Survey of Hospital Library Service in the Detroit Area. Detroit, Wayne State University School of Medicine Library and Biomedical Information Service Center, May 1966. 22p. (Report No. 19).

41. Postell, William D.
Grant Funds and the Medical Library. *Bulletin of the Medical Library Association* 46:185-87 (1958).

42. Smith, Joan B.
Study of Reference Service at Wayne State University Medical Library, January-June 1964. Detroit, Wayne State University School of Medicine Library and Biomedical Information Service Center, 1965. 7p. (Report No. 14).

43. A Study of 1967 Annual Salaries of Members of the Special Libraries Association. *Special Libraries* 58:217-254 (1967).

44. System Development Corporation
National Document-Handling System for Science and Technology. Wiley, 1967.

45. U.S. President's Commission on Heart Disease, Cancer and Stroke
A National Program to Conquer Heart Disease, Cancer and Stroke. Washington, D.C., February, 1965. 2v.

46. U.S. Veterans Administration
Professional Services: Medical and General Reference Library Staff. Washington, D.C., GPO, February 1966 (Veterans Administration Department of Medicine and Surgery Manual M-2, pt. 13).

47. U.S. Veterans Administration
VA Station Addresses and Identification Numbers. Consolidated Address Bulletin I-T. Washington, D.C., September 21, 1967.

48. West, Kelly M.
Role of the Library in Learning to Learn Clinical Medicine. Journal of Medical Education 39:910-917 (1964).

49. World Almanac and Book of Facts, 1967. Newspaper Enterprise Association, 1966.

50. Yast, Helen T. and Raymond T. Giesler
A Report on the Survey of Hospital Professional Library Service. American Hospital Association, 1964. (Unpublished Draft).

THE LIBRARY'S USER GROUPS

If we accept the tenet that libraries exist for service, we must then ask: service to whom? Without knowing who the users are, libraries will continue to use subjective judgment and arbitrary standards as a basis for planning.

It is true that the primary users come from the institutions to which the libraries belong. Faculty, students, researchers, administrators, house staff, para-medical personnel - these are the users of a medical school library. A hospital library serves house staff, para-medical personnel, and students if it is a teaching hospital. A medical society library serves its members. These are the primary users, but by no means do they constitute all of the users. Too, it is necessary to know for what purpose readers come to the library, to what extent they are satisfied with what they find, and how much they use other, non-library, sources of information. Further, it is necessary to know to what extent active and potential users know what the library has to offer, and how lack of this knowledge may hamper their optimum performance. And, most importantly, we need to look at what kinds of information these different groups need, in what form, and how quickly.

No attempt is made to present yet another critique of existing library user surveys here. This has been done by others quite well (4, 9, 19, 15, 10). It is sufficient to say that few studies exist which provide the kind of information outlined above, although some areas have been covered quite well. Librarians are conspicuous by their absence from the list of authors of such surveys, indicating to this reporter at least, that they have not considered it necessary to gather facts on their clientele. It is encouraging to note that the Institute for the Advancement of Medical Communications is in the process of providing several instruments, based on sound methodology, which will give libraries the means of coming up with badly needed answers to questions about users (12).

In the following pages, user requirements are presented, both in terms of varying information needs and in terms of different users. This presentation is based on the literature as well as on observation and interviews conducted by this reporter with a small sample of practicing physicians, research personnel and faculty.[1]

Information needs may be broadly divided into two segments:

1. The need to locate a specific fact or set of facts to solve an immediate problem ("fact-finding", or "vertical approach").
2. The need to acquire information in depth on a particular subject. May also be used to solve an immediate problem, but more often has as its purpose increased knowledge. Therefore the immediacy of response is often not as critical as in No. 1. ("review", or "horizontal" approach).[2]

---

[1] Copies of these interviews are appended to this report.

[2] The author is indebted to Dr. Thomas M. Blake, Department of Cardiology, University Medical Center, Jackson for the distinction between "vertical" and "horizontal" approaches to information, a very useful, graphic distinction.

The most commonly identified sources of information are:

1. Personal interchange with peer group, and with industrial representatives
2. Attendance at scientific meetings, lectures, seminars, and formal courses
3. Journals
4. Books, including handbooks and compendia
5. Abstracts, indexes, bibliographies
6. Promotional literature distributed by commercial firms
7. Audio-visual information sources (audio-and videotapes, radio and television broadcasts, slides, films and the like)

The above list is not arranged in order of importance; this would vary for different user groups. However, it is generally agreed that personal contact and exchange, either on a formal or informal basis, ranks very high, while formal journal publications rank second in importance.

The motivation to use the various information sources has been described well by West (23). In discussing the role of the medical school in teaching to learn, he states that the most highly motivated user is the one who learns (or reads) for an immediate, important, and practical purpose. Maximum retention of what he has read is assured. Learning (or reading) related to a special interest, or of special relevance to practical needs, is rated next in importance, while attendance at conferences and lectures, and reading books and journals regularly is rated last. The latter is done for "keeping up" with current developments (current awareness), rather than for a specific purpose.

It is interesting to note that "keeping up" was listed as the most-time consuming activity in information seeking by all those interviewed by the author. If we accept West's ranking of effectiveness, we find that more time is spent on that activity which is performed least effectively and where retention of the information found is less, than on the activity of "reading with a purpose", which consumes far less time.

If current awareness reading could be made less time-consuming, if information could be packaged in such a way that a particular user would find most of what he needs in one journal, a series of seminars, or broadcasts and the like, he could then spend the time saved in deepening his knowledge in other needed areas.

There are three major types of information search:

1. For solution to a specific problem
2. For current awareness
3. For comprehensive review of the literature

For nos. 1 and 2 currency of the information is of the utmost importance, while no. 3 requires a search through all available literature, for a specified number of years.

Major purposes of the information search are:

1. To supply needed information for the daily work of a practicing physician (fact-finding and review)
2. To supply background material for a new research project (review)
3. To supply information materials in conjunction with various levels of training and education (review, and some fact-finding)

To what extent does the library play a part in these varying information needs? We will examine the information habits of practicing physicians first. Here we must differentiate between those who are exclusively engaged in medical practice, and those who combine practice with a teaching function.

1. Practicing Physicians.

The practicing physician may first and foremost be characterized as the man "with little time". He usually has a large and busy practice, makes hospital rounds and, in some cases, house calls. Time is short, and his information needs, critical as they may be, cannot compete with time devoted to patients. He sees drug detailmen during his busy day and considers them an important source of information on new drugs. Drug firms inundate him with free material, brochures, house organs, and the like, and he feels that he must read most of this material to be informed on current medications. He subscribes to journals, (usually between four and ten titles), and reads these when he can to "keep up". When he is baffled by a diagnostic problem, he picks up the telephone to call a colleague whom he trusts. Sometimes, when he finds a review of a book that is critical as well as descriptive and tells him something about the book, he buys it. He relies heavily on a number of handbooks, the most important of which is Physicians Desk Reference. This volume, published annually, and supplemented quarterly, supplies him with information on drug names, dosages, side effects and the like.

He attends what meetings he can, mostly out of town, so that he can devote his attention entirely to what is being presented, and does not have to worry about the omnipresent telephone. Sometimes, when he feels that he needs to read something more than what is presented in his journals, he goes to a nearby library. As a rule, he is not aware of the various indexes or abstracts beyond those he used in medical school. Current Contents, Science Citation Index and the various continuing bibliographies and specialized abstracts are not known to him. He often continues to rely on the library of his medical school from which he graduated, but if he has moved to another area, he does not always realize that he can use the nearest medical library there. While in the hospital he may drop into the hospital library, but he may find that what he needs is not owned. The farther away he is from library resources, the less likely he is to think of them as an information source.

He generally feels that he keeps up as best he can, and that his information needs are reasonably well-met. He complains of the multitude of printed materials that come across his desk; "separating the chaff from the wheat" is a time-consuming task and he wishes somebody would do it for him. He would particularly like more review articles, current, concise, and presenting only the best writing. When he learns of the various selective dissemination techniques available, either on a manual or automated basis, he feels that a service such as this, tailormade for him, would be extremely important, would save his precious time, and would, he hopes, perform the evaluative function for the literature which he desires.

He believes in the importance of continuing education for practicing physicians but his reaction to seminars and meetings is varied; some are too theoretical for him to be of immediate value, although he recognizes that theory ought to be part of the continuing education function. When given a choice, he prefers the practical approach, in seminar form, where he can ask questions and benefit from the discussions of the group.

2. Physicians with Teaching Responsibilities.

Much of what was said about practicing physicians is also true of the teacher-physicians. However, he does have the advantage of proximity to his medical school's library of which he makes good use. Thus he is usually somewhat more skilled in using the information tools available, although he lacks thorough knowledge of all those the library owns. In the preparation of his lectures he uses his own library, which is somewhat larger than that of the practicing physicians, and may be quite extensive if he has a specialty. He uses the medical library for in-depth review as well as for current awareness in marginal subjects. He feels that his information needs are reasonably well-met but is eager to have comprehensive current awareness tools at his disposal.

3. Research-oriented Physicians.

Research-oriented physicians are those who engage in clinical practice, teaching and research. (Some practicing physicians do engage in research projects, but this is a relatively uncommon activity). This group consists almost entirely of specialists in fields such as cardiology, surgery, etc. These people consider themselves purveyors of information as well as users. They are looked to by the practicing physicians as the experts to consult when a problem arises in their daily practice. Their students expect from them considerable expertise and answers to their questions. Thus they feel a strong responsibility for knowing the latest and best information in their field, either based on their own research or on someone else's in their own specialty. Because of the large amount of information they have to know, they do not try to keep up with the entire field of medicine, except superficially, but rely on their colleagues in other specialties for information.

Research physicians often maintain extensive and well-indexed files of reprints and photocopies; their indexes also contain citations to journal articles, books, and symposia. These files are usually maintained without the help of librarians, although sometimes librarians are called in for consultation. Most of their departments maintain working collections of the most-often used journals in the specialty, and some basic books. The extent of these departmental collections varies from school to school.

Research physicians attend numerous scientific meetings and are often called upon to give papers. For the preparation of these, and articles describing ongoing research, they rely heavily on the library for background material as well as the scanning of current journals. Document availability is important to them; as a rule they appreciate inter-library loans but consider them too slow for most purposes. Speedier document delivery is their most fervent wish, both locally and via interlibrary loan.

They are skilled in the use of the standard bibliographic tools, preferring to do the searching themselves or to delegate preliminary searching to an assistant. The final choice of documents is almost always made by the researcher, who considers himself the only one who really knows what is needed. Serendipity is mentioned frequently as one of the advantages of "do-it-yourself" searching; much is discovered by accident that was not located through the indexes.

For their clinical work they feel that they have little need for library information; there is, of course, an occasional story of the patient being held on the operating table while the surgeon looks up something in the library, but these occasions are rare. One interviewee stated emphatically that it was too late to acquire necessary information when the unusual situation arose, but that experience and judgment were to be used insofar as possible. If the time element is not critical, colleagues are, of course, consulted as a matter of course, but rarely the library. Librarians, it is felt, do not have the competence to supply medical information; evaluation of its appropriateness must be left up to the medically-trained person.

4. Biomedical Scientists.

Biomedical scientists are engaged in research, and often also in teaching. They are heavily library-oriented, although they also maintain extensive office collections. The library is used for all three of the above-mentioned purposes: Fact-finding, current awareness and review of the literature. They are skilled in the use of bibliographic tools, making heavier use of the newer ones than the research physicians.

They are usually more demanding than the other groups, wishing for speedier service, and increased document availability. Attendance at meetings is very important in keeping up with current research findings; De Solla Price's "invisible college" is in evidence more strongly in this group than in any other (17). They know who is doing what in their respective specialty and are in frequent touch with one another. They would like to know who the outstanding people in allied fields are; another requirement is the almost immediate access to papers given at scientific meetings.

As teachers they do not always convey the use of the library to their students to the extent that this is needed. There is little formal instruction in the use of tools; students are "sent to the library" to fend for themselves.

5. Medical Students.

Medical students include undergraduates, interns, and residents. They are given some instruction in library use, usually during the freshmen year. If their professors are library-oriented, this is apt to reflect on the student's information habits. During the undergraduate years they have their own school library available, and use it for assigned reading and term papers. When they become interns, and later, residents, it is somewhat more difficult for them to obtain adequate library resources, especially if they serve their internship or residency at a hospital not connected with a medical school, in which the library facilities are sometimes minimal. They are then forced to go to another library, or to do without that which they need.

Teachers are apt to be teaching what they know, rather than teaching how to learn (23). The development of self-motivation is vitally necessary, if the future physician is to keep up with developments in his field, yet there is little evidence that this self-motivation is being taught. Unless library staff shows to the student the wide variety of reference tools available, he is likely never to find out all that is available to him. He usually takes the line of least resistance in locating information; this is also true of his teachers. He considers himself well-served by the library, requiring little beyond basic textbooks and journals, and complaining only if the document he wants is not available to him at the time he needs it.

6. Students in the Basic Biomedical Sciences.

Information requirements for these students are heavier than for the medical student. A thesis or dissertation is required, and entails considerable library work. Comprehensive literature surveys, including foreign materials, have to be made, and in-depth study of a particular subject is required. Students, as well as their teachers, attend scientific meetings when possible, and would like to have access to the papers given at meetings if they cannot attend.

In subjects other than their own, their requirements are slight, since they usually concentrate on a small subfield of an area of research.

7. Para-Medical Personnel.

Little is known of the information habits of nurses, various technologists, and other hospital personnel. There seems to be agreement that all should use the library, but to what extent they do is not known. Increasingly, administrative personnel has need of library resources, in areas not usually part of a medical library, such as management, personnel matters, budgeting or information on the state or wider geographic area, for the various regional programs now being planned. It is not known to what extent these needs are being met.

Most of the above is based on personal observation in a medical school and interviews with physicians. Several published surveys were also used (1, 8, 13, 14, 18, 20, 21, 22).

What do physicians think of libraries and what ideas have been developed by them to improve library services? In the next few pages, several ideas are presented, which, in the opinion of their originators, would improve libraries considerably.

Murtaugh (16) defines the information problem as follows: The body of available knowledge is virtually infinite and the devices used to extract this knowledge are limited; there is the chance that much important information is missed. On the other hand, the ability of human beings to absorb, retain, and apply information are definitely limited by a time-volume quotient, which is different from the time-volume flow of information. Between these limits lie the areas where information processes must be improved.

He lists many of the information sources mentioned above, and emphasizes the importance of libraries. He feels that library staff with specialized subject training is essential to the improvement of libraries, and that reference activities should rank as legitimate research work, requiring rigorous training in both bibliographic methods and a subject area.

He feels that in many areas physicians have no access to library resources, and that new ways must be found to bring the information to the user. He stresses the importance of continuing education for the physician; present means of transmitting the scientific record are virtually useless to him, yet he cannot give good health care without it. He doubts the value of drug promotion literature, and feels that better ways must be found to transmit information about new drugs. Closed-circuit television is suggested as one way of reaching physicians in outlying areas.

Cahn (5) echoes the concern of Murtaugh with the present status of information personnel. He states:

> "(information work) cannot be any longer apart from scientific work itself nor can it be considered of a lower order. Science labors to discover universal truths and then relegates its findings to communication channels whose language is a Tower of Babel, incompatible within itself..."

Ingelfinger asks librarians to help evaluate the flood of journals now crowding their shelves (11). This should be done in cooperation with "prestigious faculty members"; eventually the Medical Library Association would come up with official ratings and the ensuing boycott of "bad journals" would result in a reduction in numbers. Leake (14) and others make a strong case for serving the entire medical center with informational materials; his definition of a medical school library is:

> "...a general reference center, with special collections expanded in the fields of the various health disciplines. The general reference sources in the humanities, in literature, philosophy, esthetics, and in mathematics, chemistry, physics and biology remain the firm foundation of the first-class medical library as of any other general library."

West (23) finds that present library facilities are not used optimally. He gives as reasons the distance of the library from clinical departments, the fact that it is closed part of each 24-hour day, and that librarians are good at preserving the record, but "have no responsibility for promoting use." He finds the library to be a "crucial but passive resource", and thinks this stems, in part, from the fact that librarians do not fully understand the role of clinical medicine, and have no clinical competence. The faculty, on the other hand, does not fully understand the role of the library, and does not teach its use.

Stating that it is the role of a good teacher to "teach to learn", he finds that this is not being done, and that the medical student finds it easier to ask questions from the experts available to him than to find out for himself. West feels that not much is being learned in this way.

He advocates small collections, highly specialized, and staffed by trained people, in close proximity of the hospital units where teaching takes place. In this way, and if these collections are used routinely by faculty, the library would become a tool in clinical medicine similar to a stethoscope or scalpel.

Goodall (7) wants his librarians to perform their present activities impeccably before branching out. Only when volumes are available when needed, interlibrary loans are speeded up, cataloging is up-to-date, and missing volumes are located, should the librarian become involved in current awareness services, editorial services, translations and the like. He feels that compulsory library instruction should not be given, but that self-motivation of the medical student should be taught.

This is in sharp contrast with most of the articles found, which call for more and better library instruction.

Dryer (6) develops the idea of a "university without walls" for the continuing education of physicians. The focus here is on the patient, through the physician, which would result in high motivation. He calls for a comprehensive approach, including the improvement of individual learning opportunities at home or at the office through self-instructional devices, group learning experiences in community hospital and medical centers, and the use of newer materials, such as films, videotapes, programmed instruction, and educational television. All this would be used in a coherent, well-planned, sequenced program. Little mention is made of the more traditional resources of the library in this program. Adams (2), in reviewing Dryer's plan, assumes that the reason hospital libraries were virtually left out of the discussion might be their "depressed state". He feels that Dryer underestimates the effectiveness of a sound library base for continuing education.

Thus we find our patrons expressing themselves on what they would like to see in new or improved library services. The call for more aggressive services is dominant; almost everyone wishes for tailor-made current awareness services, which would keep him abreast of significant writing in his particular area of interest, and for up-to-date review articles which would provide him with the broad background needed to reenforce his knowledge.

Having thus described the library's user group to the extent possible, we need to look at their geographic distribution in relation to adequacy of library resources.

Data are not available on all categories of health science personnel, and some need not be considered because they are, by the nature of their work, close to medical library resources. We chose physicians as the largest and most significant user group.

Table XVII presents federal and non-federal physicians by state and Census region. Of the 289,000 physicians who are practicing in the continental United States 22,800, or 8 per cent are employed by the federal government, while another 14,500 are inactive or their whereabouts are unknown.[1] Federal physicians are employed in VA hospitals, by the Armed Forces, and by the National Institutes of Health and similar agencies. As might be expected, a considerable number are located in and around the District of Columbia. Ninety per cent are engaged in patient care, the remainder in administration and research. Because statistics are not available by state, federal physicians will be excluded from the following discussions.

A total of 89 per cent of all non-federal physicians practice medicine in metropolitan areas or counties adjacent to them. The remaining 11 per cent are located in semi-rural or rural areas.

---

[1] Source for all statistics in this section is (3).

TABLE XVII

GEOGRAPHIC DISTRIBUTION OF FEDERAL AND NON-FEDERAL PHYSICIANS, BY STATE AND CENSUS REGION, 1965

AREA	NON-FED.	FED.	TOTAL
New England:			
Maine	999		
New Hampshire	867		
Vermont	676		
Massachusetts	10,544		
Rhode Island	1,299		
Connecticut	5,063		
Total	19,448	1,096	20,544
Middle Atlantic:			
New York	38,601		
New Jersey	9,081		
Pennsylvania	16,602		
Total	64,284	2,567	66,851
E. North Central:			
Ohio	13,293		
Indiana	4,932		
Illinois	14,306		
Michigan	10,050		
Wisconsin	4,789		
Total	47,370	1,936	49,306
W. North Central:			
Minnesota	5,289		
Iowa	2,883		
Missouri	5,522		
N. Dakota	565		
S. Dakota	534		
Nebraska	1,643		
Kansas	2,427		
Total	18,863	1,171	20,034
S. Atlantic:			
Delaware	651		
Maryland	5,760		
D.C.	2,920		
Virginia	4,850		

AREA	NON-FED.	FED.	TOTAL
S. Atlantic: (continued)			
W. Virginia	1,745		
N. Carolina	4,946		
S. Carolina	2,002		
Georgia	4,285		
Florida	8,027		
Total	35,186	5,436	40,622
E. South Central:			
Kentucky	3,054		
Tennessee	4,267		
Alabama	2,733		
Mississippi	1,713		
Total	11,767	974	12,741
W. South Central:			
Arkansas	1,691		
Louisiana	3,973		
Oklahoma	2,399		
Texas	11,218		
Total	19,281	2,435	21,716
Mountain:			
Montana	671		
Idaho	615		
Wyoming	300		
Colorado	3,274		
N. Mexico	894		
Arizona	1,941		
Utah	1,303		
Nevada	412		
Total	9,410	1,090	10,500
Pacific:			
Washington	4,266		
Oregon	2,673		
California	32,441		
Alaska	155		
Hawaii	901		
Total	40,436	3,122	43,558

Total Non-Federal:	266,045
Total Federal	22,814
Grand Total	288,859*

* Excludes Puerto Rico and U. S. possessions

Source: (3)

Ninety-three percent of all active physicians are classified as engaged in patient care; the remaining 6.5 percent are full time research personnel, faculty of medical schools, or administrators. Of those in patient care, 24 percent practice general medicine, but of those, 92 percent are in solo or group practice, or partnerships. No separate data are available for those who are practicing alone as opposed to those in group practice. Of the 76 percent of all physicians who are practicing in a specialty, 63 percent are in private or group practice. Those not in solo or group practice are listed as being hospital-based.

As might be expected, the heaviest concentration of physicians is in the areas where we also found the largest library resources and the greatest number of medical facilities. The Middle Atlantic region has by far the largest number of physicians, followed by the East North Central and Pacific regions. The South Atlantic area, with its large medical facilities in and around Washington, ranks next in size, while the East South Central and the Mountain regions are lowest, both in number of physicians and number of library volumes.

Table XVIII shows number of physicians, number of library volumes, and ratio of volumes per physician. The numbers are far from accurate, since data on physicians are as of 1965, while library volumes were taken from Table II and reflect mostly 1963 figures. In spite of these shortcomings, it is interesting to note that some of the mountain states offer more volumes per physician than the Middle Atlantic region; where we find a ratio of thirty-seven volumes per physician in Pennsylvania,

TABLE XVIII

TOTAL NUMBER OF NON-FEDERAL PHYSICIANS, TOTAL NUMBER OF MEDICAL VOLUMES AND PER CAPITA NUMBER OF VOLUMES, BY STATE AND CENSUS REGION

AREA	NO. OF PHYSICIANS[1]	NO. OF VOLUMES[2] (in 000)	PER CAPITA RATE
New England:			
Maine	999	6	6
New Hampshire	867	64	78
Vermont	676	25	37
Massachusetts	10,544	732	69
Rhode Island	1,299	60	46
Connecticut	5,063	489	96
Total	19,448	1,375	70
Middle Atlantic:			
New York	38,601	2,116	54
New Jersey	9,081	301	33
Pennsylvania	16,602	624	37
Total	64,284	3,041	47
E. North Central:			
Ohio	13,293	514	31
Indiana	4,932	234	46
Illinois	14,306	796	55
Michigan	10,050	487	48
Wisconsin	4,789	172	35
Total	47,370	2,202	46
W. North Central:			
Minnesota	5,289	371	70
Iowa	2,883	114	39
Missouri	5,522	372	67
N. Dakota	565	43	76
S. Dakota	534	19	35
Nebraska	1,643	190	115
Kansas	2,427	138	56
Total	18,863	1,246	66
S. Atlantic:			
Delaware	651	56	86
Maryland	5,760	538	93
D.C.	2,920	1,726	591
Virginia	4,850	163	33
W. Virginia	1,745	78	44
N. Carolina	4,946	262	52
South Atlantic: (continued)			
S. Carolina	2,002	43	21
Georgia	4,285	190	44
Florida	8,027	199	24
Total	35,186	3,256	95
E. South Central:			
Kentucky	3,054	167	54
Tennessee	4,267	171	40
Alabama	2,733	95	32
Mississippi	1,713	75	43
Total	11,767	508	43
W. South Central:			
Arkansas	1,691	60	35
Louisiana	3,973	179	45
Oklahoma	2,399	81	33
Texas	11,218	372	33
Total	19,281	692	35
Mountain:			
Montana	671	30	44
Idaho	615	2	3
Wyoming	300	--	0
Colorado	3,274	160	48
N. Mexico	894	50	55
Arizona	1,941	10	5
Utah	1,303	70	53
Nevada	412	--	0
Total	9,410	322	30
Pacific:			
Washington	4,266	145	31
Oregon	2,673	106	40
California	32,441	1,173	36
Alaska	155	2	13
Hawaii	901	43	47
Total	40,436	1,469	36

Sources: Table II and (3)

---

[1] Figures are as of December 1965

[2] Figures are for 1962, except for "academic" category included in total which is for 1964/65

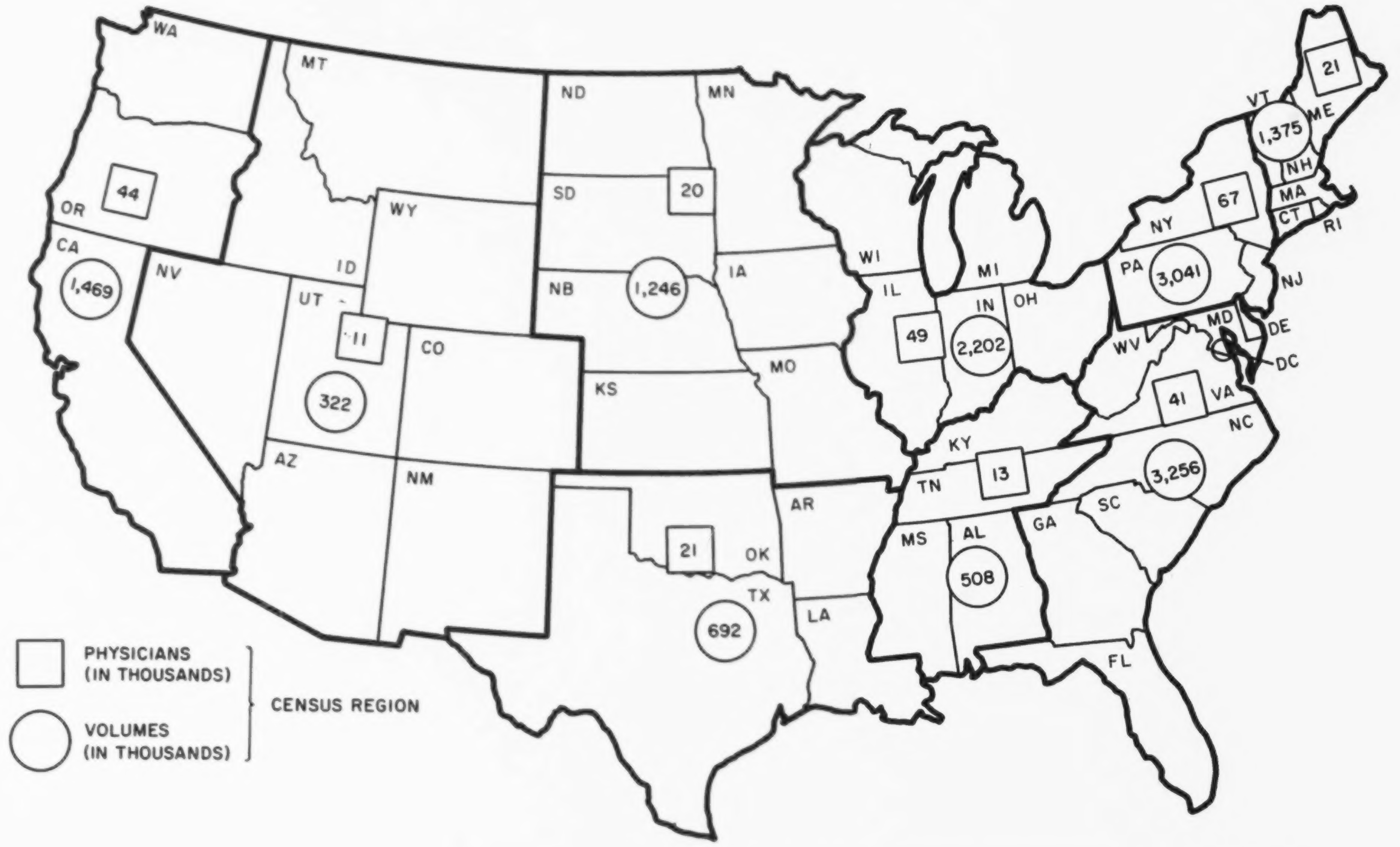
WA
MT
ND
MN
OR
44
SD
20
WY
CA
1,469
NV
ID
UT
11
CO
322
NB
1,246
IA
KS
MO
AZ
NM
21
OK
TX
692
AR
LA
WI
IL
49
MI
IN
2,202
OH
KY
TN
13
MS
AL
508
GA
FL
SC
NC
3,256
VA
41
WV
MD
DE
DC
PA
3,041
NY
67
NJ
VT
1,375
ME
21
NH
MA
CT
RI
PHYSICIANS (IN THOUSANDS)
VOLUMES (IN THOUSANDS)
CENSUS REGION

FIGURE 3. Number of physicians and number of medical-library volumes available by census region and state (in thousands). *Sources:* Orr, R. H., and Pings, V. M., "Document Retrieval; The National Biomedical Library System and Interlibrary Loans," Federation Proc. *23,* 1155–1163 (1964), unpublished Appendix; *Distribution of Physicians in the U.S., 1965. Regional, State, County, Metropolitan Area* (American Medical Association, Chicago, 1967).

while there are forty-four volumes per physician in Montana, and fifty-three in Utah. California offers its physicians thirty-six volumes per capita, while New Mexico has fifty-five.

Although this is an extremely rough way of measuring document availability, it gives some perspective to the unevenness of library resources observed earlier; and suggests some ways in which libraries might wish to affiliate themselves, based on geographic considerations as well as size. Some of these will be discussed later in this report.

Summary.

In our discussion of medical library users, we have considered the physician, whether he be a practicing doctor in his community or on the staff of a medical school. We found that eighty-eight percent of all physicians work in or around metropolitan areas, and that 93 percent are engaged in patient care.

Our "typical physician" is a very busy man, who has little time to do systematic reading. He scans mostly what comes across his desk, with little effort made to go beyond his own library. If he is on the staff of a medical school, he will use its library, both for current awareness, and review, but he does not utilize the collection to the fullest extent possible because of his unfamiliarity with specialized reference tools.

Separating significant material from all that comes across his desk is probably the greatest need of the physician in private practice; he shares with his colleague at the medical school a need for better current awareness services and review media. Our user realizes his great need for "keeping up", for continuing education, but is overwhelmed by the wealth of material, and his lack of time for reading is critical. He likes personal contact as a way of learning, especially in seminars and meetings, where he may ask questions and exchange information with his colleagues. He is aware of films and other audio-visual media, such as education television, which he considers a useful technique, too little used at the present time.

He generally wants the library to offer more aggressive, and better-advertised services, although he has some doubts about the librarians' competence to perform as an equal partner, and to understand his problems. He asks for more subject training for librarians, and for more evaluation of the literature by the library.

Most of all, he desires speedier document delivery from the library, regardless of where the documents he needs may be held. He wants to be able to find the materials held by his own library, when he looks for them, and would like to have interlibrary loans in a few days rather than weeks.

What have libraries done to fulfill these demands? In the next few pages we will examine some of the schemes which have been developed to cope with several, if not all, of the above-stated problems.

LIST OF REFERENCES CITED

1. Adams, Scott
   Hospital Libraries: Underdeveloped Care for Continuing Education. Hospitals 38:52-54 (1964).

2. Not Used.

3. American Medical Association
   Distribution of Physicians in the U.S., 1965. Regional, State, County, Metropolitan Areas. Chicago, 1967.

4. Auerbach Corporation
   DOD User Needs Study, Phase I. Philadelphia, May 1965 (AD 615501)
   Note: This report was not available for examination.

5. Cahn, Julius N.
   Closing the Gaps in Biological Communications. Federation Proceedings 22:993-1001 (1963).

6. Dryer, Bernard V.
   Lifetime Learning for Physicians: Prinicples, Practices, Proposals. Journal of Medical Education 37: June 1962, pt. 2 (entire issue).

7. Goodall, Archibald L.
   The Place of the Librarian in the Medical Team. Bulletin of the Medical Library Association 43:19-22 (1954).

8. Harris, Jerome J.
   Survey of Medical Communication Sources Available for Continuing Physician Education. Journal of Medical Education 41:737-755 (1966).

9. Herner and Company
   A Recommended Design for the United States Medical Library and Information System, v. I and II. rev. ed. Washington, 1966. (NSF-C-442, PB172 924, v.2).

10. Herner, Saul
    Information Needs and Uses in Science and Technology, in Annual Review of Information Science and Technology, v.2. Interscience, 1967, p. 1-34.

11. Ingelfinger, Franz J.
    Austere Librarians - Volte Face! Bulletin of the Medical Library Association 55:1-4 (1967).

12. Institute for Advancement of Medical Communication
Third Progress Report, covering period 4/1/67-7/31/67. Contract PH43-66-540. Philadelphia, August 14, 1967 (Privileged communication, not to be released without the Institute's authorization).

13. Jeghers, H.
Medical Care, Education and Research. Philosophy and Technics of Self-Education of the Medical Student and Physician. New England Journal of Medicine 271:1297-1301 (1964).

14. Leake, Chauncey D.
The Role of the Medical School Library in the Medical School Teaching Program. Bulletin of the Medical Library Association 41:369-378 (1953).

15. Menzel, Herbert
Information Needs and Uses in Science and Technology, in Annual Review of Information Science and Technology, v.1, Interscience, 1966, p. 41-70.

16. Murtaugh, J. S.
Communication in the biomedical sciences. Journal of Medical Education 37:1169-1182 (1962).

17. Price, Derek J. De Solla
Big Science, Little Science. Columbia University Press, 1963.

18. Rees, Alan M.
Medical Libraries and the Assessment of User Needs. Bulletin of the Medical Library Association 54:99-103 (1966).

19. System Development Corporation
National Document-Handling System for Science and Technology. Wiley, 1967.

20. Terry, Luther L.
The Crisis in Health Communications. Hospitals 38:49-51 (1964).

21. Voigt, Melvin J.
Scientists' Approaches to Information. American Library Association, 1961 (ACRL Monograph No. 24.)

22. Werner, David J.
A Study of the Information-Seeking Behavior of Medical Researchers. Thesis, Northwestern University School of Industrial Engineering and Management Science, Evanston, Ill., December 1965. 102p.

23. West, Kelly M.
Role of the Library in Learning to Learn Clinical Medicine. Journal of Medical Education 39:910-917 (1964).

COOPERATIVE PROGRAMS OF HEALTH-SCIENCE LIBRARIES

Many of the information problems outlined in the earlier chapters of this report are, or are thought to be, outside the control of libraries. However, two have been recognized as being most pressing, and at the same time susceptible to improvement:

The need for better document availability
The need for speedier document delivery

The optimum condition would prevail if each user could have every document he might possibly want available immediately to him, wherever he might be at the time. Although this is obviously impossible, efforts have been made to bring to him as much of what he needs as possible, in as speedy a manner as possible.

Because no single library can have all that is needed, cooperation among libraries has been and continues to be the way in which librarians have tried to improve document delivery services. Cooperation has been achieved in many different areas, among different types of libraries, and based on agreements ranging from informal to highly structured.

The most popular route has been that of borrowing _from_ other libraries for one's own users, and loaning _to_ other libraries for their users' needs. Various Union Catalogs, Union Lists of Serials, as well as printed catalogs of individual libraries' collections have aided this effort considerably, and their number has been increasing lately with the arrival of data processing equipment to facilitate the compilation of such catalogs. Directories of regional and national library resources have been helpful, too, although they do not contain listings of individual titles. Even though these guides help with the search, it is often difficult and quite time-consuming to find the location of a specific title. If the first library, from which it is requested, does not have it, the search must be started all over again. Too, the volume may be in circulation and therefore not immediately available. The arrival of photocopy equipment has allowed libraries to provide copies rather than the original document, preserving it for local use. Some libaries have restricted certain classes of material to in-library use only,thus increasing document availability via copies to all potential users, both within their institutions and through interlibrary loan to others.

The billing of expenditures for photocopies, postage refunding requirements, and the general requirements of the interlibrary loan system, based on a code formulated in 1952, all contribute to the slowness of the present system. Without knowing exactly where to turn for needed material, and what classes of material can be lent, copied, have to be paid for, or are free, it is difficult for the borrowing library to provide speedy service, even with maximum effort. Besides, it is often very expensive in manpower to obtain a needed item, if many avenues have to be tried before the desired document is located and delivered.

Because the Interlibrary Loan System has been entirely voluntary in the past, depending on the goodwill of both the borrowing and lending institution, there has been little effort to formulate agreements among groups of institutions which might facilitate the smooth flow of documents.

This pattern is now changing; the ever-increasing rate of publication, limited funds, and increased demands from users have pointed up the need for more formal arrangements. Groups of libraries are banding together to improve services; interestingly enough they are finding that improvement in interlibrary loan services is often only the first in a long series of steps they can take together, based on firm, written agreements and payment for services rendered.

Some of these were described in a previous section on services; this chapter presents a number of more comprehensive cooperative ventures to show developments over the past few years as well as current thinking and future planning.

Much of the current progress has come about as a result of the Medical Library Assistance Act, which charges the National Library of Medicine with the development of a national medical information network, based on existing medical libraries. National Library of Medicine is to "support and stimulate those (library) elements which can flourish, and to build and improve services through new affiliations for users of those elements which cannot function adequately." (23)

Through resources grants, 1,200 libraries will be reached, as well as 1,317 teaching hospitals (23). National Library of Medicine expects to identify, by 1971, those elements which would become essential components of a national system. These would function as regional medical libraries, and would provide service to their geographic area.

Other areas which are funded by the Act and administered by National Library of Medicine are the training of specialists in information work, improvement in secondary publications, (bibliographies, indexes, state-of-the-art reviews, translations, abstracts etc.) and research in information problems (24). All these would contribute to the new role envisioned for the medical library: that of a center for education, a learning resource center. Resource libraries would be closely related to one another and to the National Library of Medicine. The use of automation is to be thoroughly investigated, to be used in speeding services to network members as well as to individual physicians.

A study of just how such a network might work was made by Herner and Company for the National Science Foundation (10). The report recommends a highly structured system of regional libraries (district units), local libraries, information analysis centers (special units) and storage libraries (interlibrary units), all related to one another and dependent upon each other. They would be governed by firm regulations, specifying what services are to be given by whom, and setting standards for the entire system. These regulations would be developed and administered by the National Library of Medicine, which would act as the central unit of the system. Monitoring, and user feedback, and input of locally developed information are envisioned for the network.

Smaller hospital and other non-academic libraries are not specifically included in the plan, but would draw upon regional and other units for service. Training of librarians, while preparing for a career in medical librarianship and on-the-job, receives a great deal of attention; the employment of consultants is envisioned, who would disseminate information about the system to users and librarians alike.

Guidelines (9) mentions an existing network of medical libraries, and outlines the three relationships in which a medical library may find itself:

> Relationship of general equality, where borrowing equals lending
> Position of a reservoir library, where lending exceeds borrowing
> Situation where the smaller libraries borrows heavily from a larger, or reservoir library

The recommendation is made to establish formal or informal relationships with those libraries which are used heavily by the local library, and to bear a fair share of the expenses involved. "Fair share" is defined to be at least direct costs incurred by the lending library.

The development of extramural programs by the medical school library is recommended so that smaller libraries in the area may be served. Again, the sharing of costs by both borrowing and lending library is recommended, with the borrowing library bearing direct costs.

Participation in local and regional programs is encouraged, such as efforts to create union catalogs and lists, and cooperative acquisition and storage endeavours, "even though the results may seem to assist other libraries more immediately than the local library," because these plans tend to strengthen the community of libraries and thus help strengthen the local library in turn.

Just how these cooperative functions may be carried out is not defined in Guidelines, nor are examples given. It may be assumed that this was not considered within the responsibility of the authors, since the document was specifically designed to aid local medical school libraries.

Having briefly described the two documents which might be considered influential in the development of regional libraries, we need to examine some actual plans. In the following pages, brief descriptions of existing systems are given; some are nothing more than the provision of informal statewide loan services to physicians, while others provide numerous and comprehensive services, based on careful planning and firm agreements.

Most of the existing systems have sprung up in and around the major medical centers in the United States, which we identified in Chapter I. New York, Boston and Philadelphia have developed such systems; others are in Detroit, Wisconsin, Nebraska, and Connecticut. This writer found no reference to similar developments in California, although it would seem that the strong cooperative relationships existing among academic libraries there would be conducive to establishing similar ones among medical libraries.

A series of reports was prepared in 1964 in response to a request from the U.S. Public Health Service for written plans outlining regional cooperation among medical libraries. Esterquest (5), in his introduction, states that many of the programs described were in the planning stage at that time; some have been implemented since and others will probably see realization in the future, as the National Library of Medicine's plans are more clearly formulated.

Harvard: Esterquest describes a program for Northern New England, in which his own library, the Francis A. Countway Library in Boston, would become a reservoir library for the region, collecting comprehensively in all areas (6). An extramural service department would provide training for local librarians so that they would be able to offer a vigorous program of service, based upon well-selected local collections, and would be "sophisticated and efficient in the way by which the services of the reservoir libraries could be exploited." Services would also be offered to individuals: the practicing physician who does not have access to a local library. Messengers would deliver documents locally, while facsimile transmission might be used in the future for delivery over distances. An extensive publicity program would acquaint the user group with these services; Esterquest states that they should be "aggressive rather than passive". He envisions financing to be by a combination of federal grants and contractual arrangements with local libraries. The Countway Library was named the first Regional Library under the Medical Library Assistance Act. Unfortunately, no information is available on its plan beyond the 1964 article described.

Yale: Kilgour tells of Yale's services to Connecticut hospital libraries, which began in 1950 (13). A group called the Associates of the Yale Medical Library helps support this work by paying for duplicate subscriptions to journals which are made available to all hospital libraries in the state. Members of Kilgour's staff have visited many of these hospitals to acquaint them with Yale's service and aided them in the organization of the library, acquisitions, and services. A simple classification scheme was devised for small libraries, and librarians were taught its use. The Yale library serves as their reservoir library, filling all requests which cannot be obtained locally; demands for this service have increased substantially over the years. Yale considers this a "professional and scientific courtesy to improve health in Connecticut and aid medical research outside the Yale community", expecting nothing in return.

Plans for the future include computerization of Yale's catalog, together with that of Columbia and Harvard, which would offer access to a vast bibliography of holdings in that region. Hospitals could be connected to the computer via terminal and would therefore have immediate access to location information.

Nebraska: Hetzner describes Nebraska's extension service (11). Because of the absence of medical library resources in that area, the Nebraska University Medical School early assumed responsibility for the provision of medical library materials. The area of service extends far beyond the state's borders, as far as New Mexico in the south, Wyoming and Montana, North and South Dakota, as well as Arizona and Colorado. Many requests are received for Interlibrary Loans, while others are asked for directly by physicians. If a volume is not owned by either the Medical Library or the general university library, it is borrowed from the National Library of Medicine, the Nebraska library acting as an intermediary. Because the university maintains its own bindery, volumes are always available to the user.

As of the time of this report, the service offered by the University of Nebraska Medical Library had not been widely advertised, but was meeting the needs of "those who exercised the initiative to seek out the resources available". If adequate funds became available, and space were sufficient, this service could be extended and publicized and could become "an invaluable link in a national network".

Wisconsin: Wisconsin has given statewide medical library service since 1926, when the medical school, the university extension service and the State Medical Society jointly decided to establish direct service to physicians (4). The medical society provided its books and journals obtained through exchange, which, to this date, form the nucleus of a separate loan collection maintained specifically for the extension service. Any item not in the collection can be borrowed from the Medical Library collection. Most loans are made in the original; copies are provided only if the item comes from the Medical School collection, and cannot be loaned. The report states that it is far cheaper to send the original than to provide photocopies, since the original can circulate many times, while separate photocopies have to be made for each request.

A small staff of two part-time people maintains the service; about 100 requests are received per month for specific articles and books, as well as subject requests, which are usually filled with selected articles. No extensive bibliographies are prepared. Most loans are made directly to physicians; other users include hospitals and clinics, commercial firms, libraries, (other than medical), attorneys, high school students and research workers.

Fees are charged for postage and wrapping and for photocopy of more than ten pages.

Plans for the future would include increased funds for this service so that it may be more widely advertised and used. Free mailing and copying service is deemed desirable, as are current awareness services to physicians via xeroxed pages from Index Medicus. A special service to high school students is envisioned which would serve as a recruiting device for the medical profession.

Several ways in which Wisconsin's service might be promoted are described. There could be exhibits at state medical conventions, letters to newly registered physicians, acquainting them with the service, presentations at continuation courses for practicing physicians, both within and outside the medical school, frequent listings of additions to the collection, and greater use of a news column in the Wisconsin Medical Journal.

It is interesting to note that this service has been conducted, apparently successfully, with a very small collection; there were 1,700 books which, the author states, could be reduced to a basic collection of 100 volumes and still do the job, and 185 journals. Studies have shown repeatedly that there are something like 100 journal titles which are most frequently used by researchers; Wisconsin's experience seems to prove that this is also true in the case of practicing physicians.

Philadelphia: Philadelphia's library of the College of Physicians is one of the oldest medical libraries in the country and has a long tradition of service to its community (15). It serves a seven-county area in Pennsylvania and New Jersey, containing five medical schools, seventy hospitals, ten pharmaceutical companies, 3,500 physicians, and

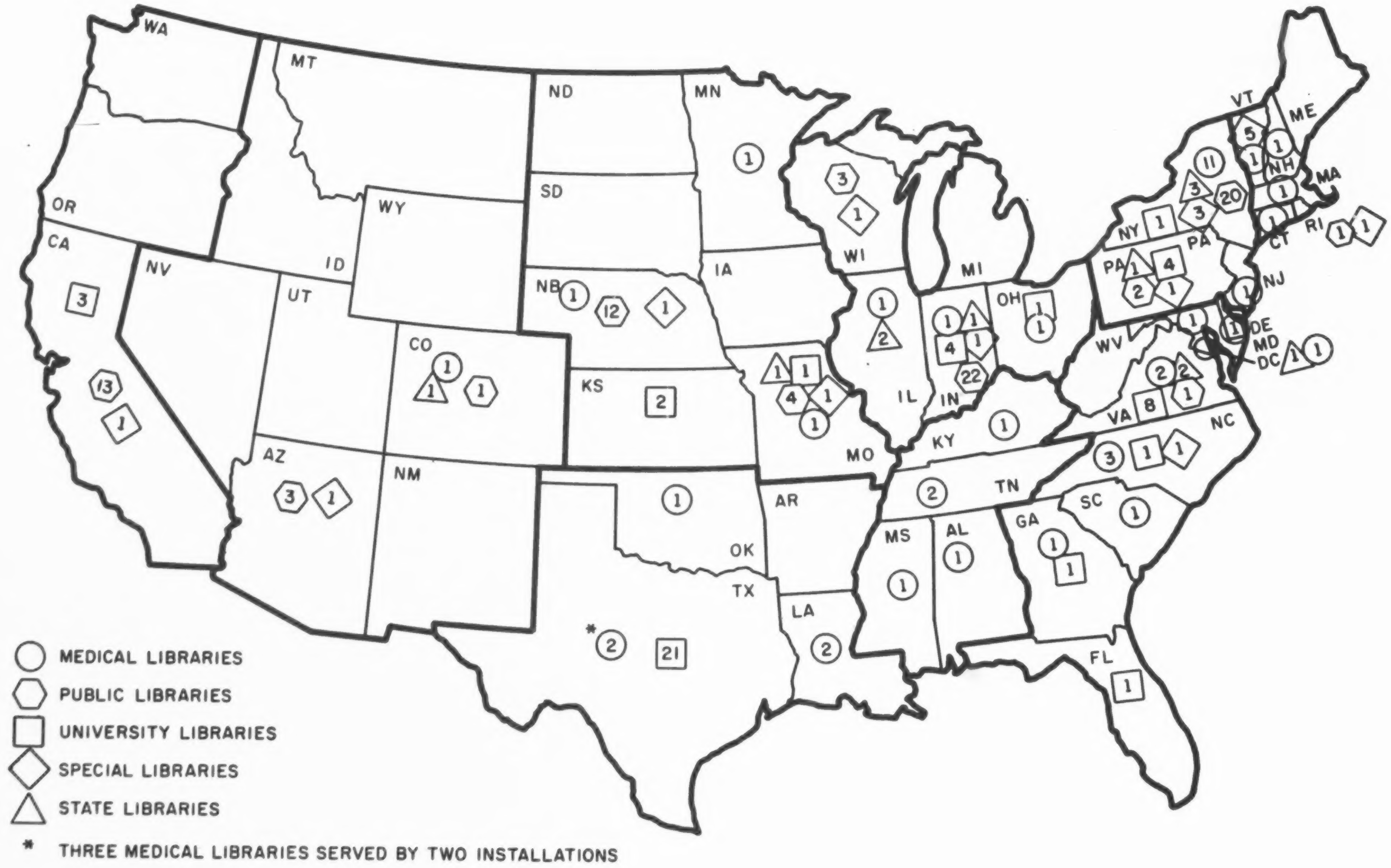
○ MEDICAL LIBRARIES
⬡ PUBLIC LIBRARIES
□ UNIVERSITY LIBRARIES
◇ SPECIAL LIBRARIES
△ STATE LIBRARIES
* THREE MEDICAL LIBRARIES SERVED BY TWO INSTALLATIONS

FIGURE 4. Number of TWX installations, by type of library, state, and census region. Source: TWX Directory, 1967, and personal communications from medical librarians.

four major medical publishers. There are also schools of osteopathy, pharmacy, medical technology and nursing.

The library is aided in its efforts by the Union Catalogue of Philadelphia, in existence since 1940, a Union List of Serials for the area, and a liberalized Interlibrary Loan Code in effect among Philadelphia libraries.

Its services consist of abstracting, indexing and scanning of incoming journals; literature searches are offered, as are translations. There is a publications program as well.

The College of Physicians Library has been supported by donations of collections from its Fellows, as well as their dues; recently, this has not been sufficient to meet its needs, and donations have been solicited and received from local libraries. However, additional funds are needed to maintain the level of services presently offered, and federal funds would provide the additional financing needed, if the College of Physicians could be considered eligible for such funds.

This library has recently submitted an application to the National Library of Medicine to become a regional library, and it is expected that federal funds will be forthcoming.

Philadelphia librarians and the deans of their respective institutions have met together for some time to develop more firmly such cooperative ventures as would benefit them all. A recommendation was recently made by the medical librarians that they cooperatively support the College of Physicians library rather than to continue the duplicate acquisition of materials for each, thus avoiding the necessity of meeting the 100,000 volume standard mentioned as necessary for adequate service (16).

Indiana: The Indiana University School of Medicine Library installed TWX in 1966 as a member of a statewide TWX service among larger libraries in the state sponsored and supported by the Indiana State Library (12).

Twenty-two public libraries, four university libraries and the medical library are connected by TWX, while 100 other community libraries are connected by telephone to this network. A physician calls his local library, the request is transmitted to the nearest TWX library, from there to the Medical Library, and interlibrary loans are on their way to the physician, usually within 24 hours. The service is free and photocopies are usually supplied. If hard copies are loaned, patron pays only return postage, and if photocopies are longer than twenty exposures, patron pays excess at the rate of 10¢ per page. Other medical libraries and the National Library of Medicine can, of course, be asked to supply loans to the medical library which then speeds the material on to the physician.

U.S. Veterans Administration Library System: This system was described before; it is, in fact, a network of 175 libraries (21, 22). When material is not available locally, and attempts to borrow from nearby libraries have been unsuccessful, the VA General Reference Library is asked to supply the material. If the material is not owned, the request is filled from the National Library of Medicine collection through the General Reference Library. There is no electronic communication, and the service has been slow in the past, necessitating the use of other libraries by VA libraries. If this existing network of VA libraries could be made more efficient, it would provide access to library resources for physicians in remote areas, where no other medical library facilities exist.

New York: In New York, the state where most of the nation's medical library resources are concentrated, we also find the most comprehensive planning. This is true not only for medical libraries in that state, but also for other types of libraries. The well-known 3 R's plan to establish a number of regional reference and research libraries has been implemented, massive state aid for libraries was appropriated by the legislature, and statewide, coordinated planning for all types of libraries is being carried out (1).

In 1963, Esterquest studied medical libraries in New York State and made a number of far-reaching recommendations. (7) Mr. Esterquest sums up medical library problems as consisting of the inability to cope with demands from the research community because of insufficient collections, haphazard acquisitions and inter-library loan procedures, poor communications between libraries, and insufficient payment for services rendered by one library to another.

In his recommendations, he considers the library as a provider of documents, rather than of information services. However, within this traditional concept, his recommendations are sound. Each medical school library should have a 90-95 per cent collection, that is, be able to satisfy 90 percent of all requests. The remaining requests, not available at the school library, should be obtained from a reservoir library.

He recommends that existing borrowing and lending patterns be studied carefully, and that special arrangements be made, based on these patterns, so that borrowing and lending relationships among different types and sizes of libraries might become more firmly established. Only certain well-defined types of materials would be loaned by the reservoir library to the medical school library, which, in turn, would be a smaller reservoir for its own group of libraries, consisting of hospitals and similar institutions. Patterns between all three types of libraries should be established, based on the types and number of items regularly requested.

Esterquest suggests that the library of the New York Academy of Medicine should become the medical reservoir library for the state, while the New York Public Library (Science and Technology Division) should be the source for scientific and technical materials.

He states that neither library has a primary institutional clientele, and therefore both are better able to serve the state at large than, for example, a medical school library with its primary duty to serve staff and students.

The New York Academy of Medicine library would not lend directly to smaller libraries; these would ask for material from their own smaller reservoir (medical school) library. If the material was not owned by them, it would be requested from New York Academy of Medicine, and if New York Academy of Medicine did not own it, it would only then be requested from the National Library of Medicine.[1]

---

[1] Several studies cited previously found that the library-rich states borrowed most of the items requested from NLM, rather than requesting from their neighbors first. The interlibrary loan burden has become far too heavy for NLM; Esterquest suggests one way in which it might be lightened.

He recommends that all of the direct cost connected with an interlibrary loan should be paid by state funds to the reservoir library; this reimbursement would be doubled so that the reservoir library's resources could be strengthened as well. Local libraries would not pay (except for their own indirect costs inherent in requesting a loan); provision of state funds for this would help to equalize research resources. State funds should also pay for photocopy equipment in each resource library so that smaller libraries may receive copies of journal articles. All resource libraries should be tied together via a fast communications system, such as telefacsimile or, teletype. Requests could then come to the smaller reservoir library with great speed, and be channeled from there to the smaller library in photocopy form.

Esterquest recommends that acquisitions be planned cooperatively, not only among medical libraries, but also among academic and other general libraries for materials in the basic sciences and other areas related to medical research.

He also urges that a portion of state funds be set aside for direct grants to the smaller reservoir libraries, among which all health science school libraries are included. This would bring them to the 90 percent collection considered necessary by Esterquest for adequate service. The amount of these grants would be based on the excess of the present year's book budget over the past three years' budget, insuring that local library budgets would not be cut as a result of the state grant allocation.

Many of Esterquest's recommendations have since been carried out; some in conjunction with the overall plan for library development in New York State.

The Library of the New York Academy of Medicine is indeed functioning as the reservoir library for the state, and state aid, both for loans reimbursement and for equipment, is making this possible. There is no question that this library will become a regional medical library under the Medical Library Assistance Act before long.

One of the truly significant developments in New York is the formation of the Medical Library Center of New York. Based on the experiences with New England depository, Midwest Interlibrary Center and the New Hampshire cooperative storage facility, its original purpose was to store little-used materials for medical libraries in New York city and to service this collection. However, right from the outset, it was planned to support other activities as well. A Union List of Serials was to be created, a uniform system of cataloging was to be achieved by its members, and acquisitions were to be coordinated among members (14).

The Medical Library Center is governed by a Board of Trustees, consisting of one administrator from each sponsoring institution (8). An Advisory Committee of Librarians functions as well, aiding in evaluation of existing services and suggesting additional ones.

There are three classes of memberships:

Sponsoring Institution: $10,000 per year fee
Participating Institution: $2,000 per year
Commercial Firm: $5,000 per year

Membership at the present time consists of eleven sponsoring institutions, and twelve participating members. There are as yet no industrial members.

The following are sponsoring institutions:

Columbia University College of Physicians and Surgeons
Cornell University Medical College
New York University School of Medicine
Albert Einstein College of Medicine
New York Medical College
Rockefeller University
Memorial Sloan-Kettering Cancer Center
New York Academy of Medicine
Department of Health of the City of New York (2 libraries)
New Jersey College of Medicine and Dentistry
Mount Sinai School of Medicine (new school)

The eleven participating institutions consist of nine hospitals and two Academy of Medicine libraries located in suburban areas.

A building was acquired in 1961, and occupied in 1964. Grant support was received from a number of foundations, both for the purchase of the building and the compilation of a union catalog of periodicals. Staff numbers eighteen at the present time, seven of whom are professional librarians.

Materials may be stored in two ways: Either for permanent storage or as temporary deposit. Storage is for less-used materials, and certain classes of materials have emerged as those most usefully stored and shared by members:

Back runs of journals
Older textbooks and monographs
Certain rarely used foreign journals
Institutional administrative reports
Back files of medical school catalogs
Medical dissertations
Public Health Service publications (the Center is depository)

Dissertations and journals which are not held by any library in that area (but which are indexed in Index Medicus) are acquired on a current basis by MLC.

The lender's services are manifold: Interlibrary loans are, of course, available to anyone from the depository collection; members may receive unlimited loans free, while non-members pay $3.00 per loan. Xerox copies are supplied in lieu of volumes when possible. There is daily delivery of loans from and to MLC as well as between member libraries. Reimbursement for Xerox copies is done by the Center, relieving members of all paperwork. The installation of TWX in 1967 has helped speed up interlibrary loans, while providing a written record of each transaction. Only sponsoring members have TWX at the present time. All costs for Xerox equipment, delivery service, and TWX are born by the Center from membership fees. A computer-based union catalog of medical periodicals, listing the holdings of sixty-eight medical and paramedical libraries in the New York metropolitan area, is used by members to locate titles for inter-library loans. The union catalog is a service activity, files are continuously updated, and location information can be supplied at all times, even though the information may be too new to be incorporated in the printed volume. Listing of an individual library's holdings can be printed out, as can lists for libraries in certain areas as smaller union lists.

Felter (8) describes the progress made at MLC and has some interesting comments on the concept as a whole as well as particular successes and set-backs.

She feels that the Center, far from being a passive storage facility, is most appreciated by its members for the services it renders. The storage idea is not so well understood by all, or, at least, has not been entirely successful. While deposit storage was intended as a limited measure to relieve a library's temporary storage problem, it has, in fact, been used to store long runs of commonly held journals permanently, but without making them available for consolidation into the collection. Felter feels that this "implies a lack of commitment to the idea of a central depository collection. It also reflects the outmoded belief, on the part of institution administrators, rather than librarians, that the size of the library is a status symbol, even though a large proportion of the volumes are too old or unsuitable to earn their keep."

Larger libraries, too, have been reluctant to give up long files of back journals to the Center; the interpretation of "less-used materials" has been left up to each individual library, and the result has been that some of the collection has duplication in both depository and storage, gaps that could be filled from members' holdings, and, in some cases, runs of recent journals, which are by no means "less-used" in most libraries. Total holdings now include over 100,000 journals items (bound volumes and unbound issues), over 40,000 monographs, textbooks and various reports, and over 200,000 dissertations.

While there have been problems with the storage aspects of MLC, the services have been enthusiastically received and supported. The first, and still the most popular, is the delivery service, daily to all within New York, and three times per week to New Jersey, twice a week to Long Island. Since the beginning of the service in 1964, 38,000 miles were traveled while picking up 53,504 items and delivering 42,568. About half of these items were picked up and delivered just during the year 1966, the last year for which figures are available.

The Xerox copy reimbursement service was begun in 1966. The lending library simply sends a statement to MLC showing amount due it from other libraries, at 10¢ per page. MLC pays this bill from its own (membership) funds, thus alleviating time-consuming billing procedures among libraries.

TWX began in 1967 (20). The members feel that it is far superior to either the messenger delivery of ALA forms (because it is faster), or telephone calls (because there is a written record). Monthly rental is paid by MLC, members pay for calls. Although intended for interlibrary loan, TWX is also used for querying the Union Catalog. Payment for Union Catalog service has been on a service fee basis for libraries in the New York area, not members of MLC, and copies have been sold at cost to libraries outside the New York area, because it was felt that they would not need the location service. However, the pricing of the Union Catalog might have to be changed because of the installation of TWX in numerous medical libraries throughout the country, which may resulting in long-distance inquiries as well-as local ones.

Felter feels that the future of the Center may lie in providing services rather than providing storage for books. A grant was received from the National Library of Medicine to study centralized automated record keeping for circulation and serials control for all member libraries. It will be most interesting to see the results of this study, for it should have wide applicability in other areas of the United States.

If the New York Academy of Medicine library becomes a regional library under NLM's grant support and a MEDLARS Center as well, the Medical Library Center will become a subcontractor to NYAM library, filling requests from its collection via the regional library (3).

This plan, if realized, can serve as a prototype and perform a valuable service by testing methods of centralization, as MLC has begun to do already. Located in the richest area, both for resources and funds, these libraries will be able to pioneer developing concepts and establishing patterns for others to follow. Already, this group has developed some new methods of coping with bottlenecks in document delivery; it is hoped that this work will continue and that others may benefit from it.

Another interesting and unique program going forward in New York State is the formation of a Biomedical Communications Network among three medical libraries in widely dispersed areas of the state, all three of which are part of the State University of New York (SUNY).

In 1965, SUNY members determined that the most effective way to implement communications projects among them would be to establish for New York State an organization, similar to the then newly founded EDUCOM (Interuniversity Communications Council). INTRACOM was formed, and two

Task Forces began to study inter-library communications (18, 19). The Task Force on Medical Libraries developed a plan whereby the three medical libraries of Buffalo, Brooklyn and Syracuse would be able to use their combined resources more effectively. It became apparent that this plan, if successful, could serve as a prototype for all of the sixty campuses of SUNY.

The Upstate Medical Center Library at Syracuse is headquarters for the network and its librarian, Irwin H. Pizer, is Director. A two-year planning period will be followed by implementation of a computer network in September of 1968. The computer, an IBM 360/40 with peripheral equipment, will be library-owned and will provide real-time, on-line access to a catalog of all titles held by participants.

Several important steps have already been accomplished in anticipation of the computer. IBM 2740 communication terminals were installed in 1965, linking the three libraries and the medical library at the University of Rochester. Albany Medical College is expected to join in May 1968. The terminals have been used for reference and inter-library loans. Additional ones will be installed for direct computer input in the participating libraries as well as in the library of the new medical school at Stonybrook. Another will be placed in the National Library of Medicine for direct communication with the network.

All catalog records of participating libraries are in the process of being converted to machine-readable form; the Syracuse collection is being indexed in depth; that is, individual chapters of books are given a heading or headings, in addition to subjects assigned to the entire title. Studies at Syracuse have shown that monographic material is used extensively there, and it was felt that greater depth of indexing would make this form of publication more useful. Both the subject headings provided by the Library of Congress and MESH (National Library of Medicine) are being used, and additional subjects are developed in areas not well covered by either system, such as psychology and psychiatry. A thesaurus is being developed which will provide a uniform, integrated set of terms. Synonyms are being inserted freely into this list, which will be used to formulate direct queries to the computer by a user at his console, likely without the aid of a librarian.

In addition to its own store of catalog information resulting from conversion, the network will also store MARC and Current Catalog information, as well as L.C. headings and MESH headings. Science Citation Index tapes will be acquired later. A contract was awarded by NLM for the conversion of NLM Current Catalog tapes to MARC format. Shared cataloging is being provided to NLM, and a union catalog of the NLM Current Catalog, Countway Library in Boston and SUNY is being prepared for current acquisitions.

A Union List of Serials, containing 25,000 titles, has been compiled; from the existing data base other, smaller listings are made as needed for various groups and areas.

Contrary to most libraries undertaking automation activities, housekeeping functions, such as ordering, circulation and the like, have lower priority in development than the functions which will benefit the user directly. Syracuse has an automated circulation system; other libraries' records will be added as they become available. Some order assistance is given the new library at Stony Brook by providing 1966 and 1967 imprint information for acquisitions.

Several significant contributions to library cooperation seem to be in the making here. A very powerful data base will be developed for direct query by the user; it will be most interesting to learn what problems will arise in organizing what is surely the largest machine-based file of bibliographic information anywhere, and much can be learned from this.

Too, librarians have considered merging of L.C. and MESH terms to be very difficult, and requiring years to accomplish. If the SUNY group can demonstrate that this can be done successfully and reasonably quickly, the implications are great for integrating some of the major indexing systems. This has been demanded by users for some time; perhaps SUNY's experience will provide the key to accomplishing the heretofore impossible.

Too, it is likely that this large store of information will be tapped by the other libraries in New York State, not members of the University system. Although this possibility is not presently being considered in any of the information from SUNY received by this writer, it would appear to offer great promise for shared cataloging, improved interlibrary loans among all libraries and possibly centralized processing, performed under contract. Console access from industry and research institutes to the data base would seem to be another possibility.

In short, the network may well serve as the protype of a national information system and it is hoped that progress will be reported and disseminated widely so that others may benefit from this information.

Several other libraries have submitted plans to the National Library of Medicine to become regional resource libraries. These plans were not available for inspection except for one, which has been developed by Vern Pings of Wayne State Medical Library, but has not yet been accepted by the libraries in the area, nor has it been submitted to NLM. (17)

Because of its unique approach, it is described here in some detail. Pings bases his plan on the assumption that no single library can or should be "the" resource library for a given area. His region, the four midwestern state of Ohio, Michigan, Indiana and Kentucky[1], includes some strong medical collections, but, contrary to New York, contains no single library outstanding in resources above all the others.

He views a regional library as an administrative unit, which would develop, promote, and support libraries, rather than incorporate them into a rigid system. This administrative unit could be located at Wayne State University Library, or, if the members deemed this desirable, at another library. Its functions would be different and its fiscal policies distinct from those of the host library.

Pings feels that any of the eight major medical libraries in the area could accomodate the administrative unit and act as a host library, if the resources of the other seven were available and accessible.

He finds that there are eleven libraries in the area which serve health sciences personnel as their primary function. Collectively, they hold 1,126,225 volumes, and receive 17,415 periodical titles. Twenty-three thousand eight hundred twenty-five items were lent by all of these library via inter-library loan during a recent year.

---

[1] It was recently learned that the region now includes only Ohio, Michigan and Kentucky.

A number of cooperative ventures already exist among these libraries. There is the Indiana TWX network, mentioned above; a similar network includes libraries in Kentucky, North Carolina, Virginia, and other. Seven of the institutions belong to the Center for Research Libraries (formerly MILC), a cooperative storage facility. The Detroit area has formed a strong cooperative group under Wayne State's leadership.

Several Union Lists have been prepared by groups of libraries within the region. With this demonstration of talent and willingness to solve some of the problems, Pings feels that the concept of regionalism under the Medical Library Assistance Act can serve to increase access to the scholarly record for all qualified users.

Among qualified users, he counts physicians and dentists as most important, and finds that approximately one-fifth of all physicians in the four-state area have little or no access to library collections. Pings states that:

> "even with the best of communication and document distribution system the task of providing library service to *this segment of the biomedical population on an individual basis would be an impossible task for the existing resource libraries to undertake. Only by utilizing the ...resources of the 614 hospitals of the region...can any hope of access to the scholarly record for all physicians and dentists be attained.*"[1] (Italics supplied)

Thus Pings concentrates, in his plan, on service from the regional library to local institutions and agencies, rather than to individual physicians. Only in cases where no local agency is available to handle the request will the regional library give direct service to an individual.

---

[1] p. 7

He strongly advocates monitoring devices to insure that the local agency and the regional library both carry out their functions in an optimum fashion: "The provision of service is a two-sided responsibility; the recipient as well as the giver of service has responsibilities."

Pings lists eight areas of service which should be implemented, although he admits that little work has been done in the past to establish a need for some of these services.

1. Document Delivery Service: The most important function of the regional library is to locate and arrange for document delivery. No one institution can hope to supply 90 per cent of the documents requested from its own resources, but collectively, the libraries in the area are assumed to have what is needed. Evaluation of available resources and specific location information must be developed by the regional library at the outset of the program, so that it can be determined what materials need to be purchased. No materials should be supplied by the regional library which are owned by any of the resource libraries in the area.

Policies to implement better document delivery include: Restriction of serials to non-circulation, so that they are available for requests. Written, carefully developed policies and procedures are to be distributed to all institutions, specifying request format, non-availability of certain documents, etc. Copies will be sent whenever possible; request will be accepted via TWX, mail or telephone.

Requests from individuals without library service are accepted in any form.

Interlibrary loan requests forwarded to the regional library, for which the item cannot be supplied by the host library, are referred to another library known to have the item, or the item is secured and then forwarded to the requesting library.

All document requests are honored within 24 hours and mailed First Class. All libraries which supply documents will be reimbursed at cost plus $1.00.

a. Availability and access to documents: All titles indexed in Index Medicus and other major indexes and not owned by any of the resource libraries will be made available through the regional medical library, as well as all English language texts and monographs. Location information will be distributed via a union list of all serials holdings in the area and a cumulated catalog of the regional library's current monographic acquisitions, to which holdings of other libraries can be added, particularly for foreign works.

b. Participating Libraries: Participating libraries would observe the same policies as the regional library except that they need not maintain a non-circulating policy for serials. Participating libraries will supply items to requesting libraries if the item is temporarily unavailable at the regional library.

c. Monitoring: Because of expense involved in the interlibrary loan program, careful monitoring will be an integral part of the regional library's activities. A continuous audit of document flow within the region will be maintained, related to type of institution, size, and amount of contribution to library service by each institution. Only in this way can realistic budgets be formulated, and sound policies devised.

2. Reference Service: As defined by Pings, this is the activity which "identifies, verifies and/or locates citations or "addresses" to documents." Information service is discussed separately.

a. Host library Service: Reference service requests are accepted under the same rules as document delivery requests, that is, through institutions when available, direct, when a physician has no library available. Verification will be undertaken for individuals only if they have no local library service available. Subject reference service will be provided for questions suitable for MEDLARS searches and for those questions for which the requesting library does not have sufficient bibliographic resources. Recurring searches are to be provided only if they lend themselves to MEDLARS capabilities.

MEDLARS searches are to be offered as part of the regional library's program.

3. Information services: Four categories are defined:

a. Simple facts
b. Simple summaries
c. Complex facts
d. State-of-the art reviews

The latter two involve evaluation of sometimes conflicting statements, d.) requires comprehensive review of all existing information on a given subject, and its synthesis into a coherent report.

The regional library will offer simple facts, simple summaries and complex facts; no state-of-the-art reviews will be attempted. It may act as an agent to obtain these from elsewhere.

Monitoring for all of the above services is carefully defined; for example, no reference or information requests will be accepted by the regional library unless it has been assured that resource libraries were unable to supply the answers needed.

Consultation services are offered, and strongly advocated as being essential to the successful operation of the local libraries, without which the regional library cannot function. Staff from the regional library would be available for aid in the areas of technical services (strengthening and organizing local collections), space utilization, automation activities, personnel administration, and the conducting of surveys.

Beyond the less formal consultations, a rather formal teaching program will be developed, whereby librarians and representatives from their own institutions will be invited to workshops, demonstrations and the like. In-service training to improve the technical competence of librarians in the region is considered essential as are efforts to work with local library schools to improve formal courses and internship programs.

Audio-visual materials should be serviced in the same manner as books and journals, necessitating the creation of lending services, union lists, and consultation services to aid librarians with establishment of collections.

Pings states very strongly that feedback must be built into the regional library system; that it must become more than just another bureaucratic unit, but instead a dynamic system, responsive to the needs and reactions of its users, both institutional and individual. He advocates a firm linkage between the soon to be established regional medical programs (of whom six are planned for his area) and the library program, with representatives of the regional medical programs forming an advisory council even before the programs themselves become operational.

In this writer's opinion, Pings' proposal is soundly conceived and incorporates in it both realistic assessment of the present situation in which libraries find themselves and imaginative planning for the future.

The two systems described for New York and Pings' proposal incorporate many of the elements considered essential for medical library development.

The final chapter of this report will present some of these and attempt to define the future role of the medical library in a biomedical communications system.

LIST OF REFERENCES CITED

1. Annan, Getrude L.
   Regional Plans for Medical Library Service: New York State and the New York Metropolitan Area. Bulletin of the Medical Library Association 52:503-508 (1964).

2. Cain, Alexander M.
   Steps Towards a Computer-Based Library Network. Bulletin of the Medical Library Association 55:279-289 (1967).

3. Clausman, Gilbert J.
   Regional Cooperation in New York, (unpublished talk before the Southern Regional Group of the Medical Library Association, presented on October 14, 1967 in New Orleans).

4. Crawford, Helen
   Regional Plans for Medical Library Service; Proposal for an Expanded Medical Library Extension Service for Wisconsin. Bulletin of the Medical Library Association 52:514-520 (1964).

5. Esterquest, Ralph T.
   Regional Plans for Medical Library Service. Bulletin of the Medical Library Association 52:497-498 (1964).

6. Esterquest, Ralph T.
   Regional Plans for Medical Library Service: The Countway Library Plan for Regional Medical Library Service in Northern New England. Bulletin of the Medical Library Association 52: 521-523 (1964).

7. Esterquest, Ralph T.
   Strengthening Medical Library Resources in New York State. Albany, State University of New YOrk, 1963. 30p.

8. Felter, Jacqueline W.
   The Medical Library Center of New York: A Progress Report. (Unpublished manuscript, to be published in Bulletin of the Medical Library Association, January 1968.)

9. Guidelines for Medical School Libraries. Journal of Medical Education 40, pt. I:1-61 (1965).

10. Herner and Company
    A Recommended Design for the United States Medical Library and Information System, V.I. and II. rev. ed. Washington, 1966. (NSF-C-442, PB172 924, v.2).

11. Hetzner, Bernice M.
Regional Plans for Medical Library Service: The Nebraska Plan for Medical Library Extension Service. Bulletin of the Medical Library Association 52:499-500 (1964).

12. Indiana Installs Teletype Facility. Bulletin of the Medical Library Association 55:237-238 (1967).

13. Kilgour, Frederick G.
Regional Plans for Medical Library Service: Regional Library Services of the Yale Medical Library. Bulletin of the Medical Library Association 52:501-502 (1964).

14. Meyerhoff, Erich
Medical Library Center of New York. Bulletin of the Medical Library Association 51:501-506 (1963).

15. Morse, Elliott H.
Regional Plans for Medical Library Service: Medical Library Cooperation in Philadelphia. Bulletin of the Medical Library Association 52:509-513 (1964).

16. Philadelphia Medical Librarians Urge Cooperative Expansion. Bulletin of the Medical Library Association 51:281 (1963).

17. Pings, Vern M.
Regional Medical Library Program. (Unpublished draft).

18. Pizer, Irwin H.
The State University of New York Computerized Biomedical Information Resource, in The Brasenose Conference on the Automation of Libraries; Proceedings of the Anglo-American Conference on the Mechanization of Library Services, held at Oxford...30 June - 3 July, 1966. London, Mansell, 1967, p.151-164.

19. State University of New York. Upstate Medical Center.
Biomedical Communication Network Progress Report, October 4, 1966.[1]

20. TWX Biomedical Communication in New York. Bulletin of the Medical Library Association 55:355 (1967).

21. U.S. Veterans Administration
The Medical Library Program in the Veterans Administration. Washington, D.C., n.d. (folder).

---

[1] Additional information was received too late to be included in the List of References in its proper place; it is listed at the end of the numbered listing.

22. U.S. Veterans Administration
Professional Services: Medical and General Reference Library Staff. Washington, D.C., GPO, February 1966 (Veterans Administration Department of Medicine and Surgery Manual M-2, pt. 13).

23. Wilson, Marjorie P. (and others)
Extramural Programs of the Medical Library of Medicine: Program Objectives and Present Status. Bulletin of the Medical Library Association 54:293-310 (1966).

24. Wilson, Marjorie P. and Martin M. Cummings
The National Library of Medicine: Relationship to Medical Education and Research. Journal of Medical Education 40: 225-232 (1965).

Additional sources:

1. Cain, Alexander M. and Irwin H. Pizer
The SUNY Biomedical Communications Network: Implementation of an On-Line, Real-Time, User-Oriented System. (Unpublished version of a paper presented before the Annual Meeting of the American Documentation Institute, October 1967).

2. Personal Communication from Irwin H. Pizer, dated January 10, 1968.

THE ROLE OF HEALTH SCIENCE LIBRARIES IN A BIOMEDICAL INFORMATION SYSTEM

We have examined health science libraries in detail, in terms of facilities, collections, staff, services, location, and cooperative agreements between them. Users were described insofar as this was possible. We now need to determine how health science libraries might fit into a national biomedical information system, which is designed to bring information, in the form in which it is needed, and as quickly as possible, to practicing physicians, medical schools staff and students, and research and hospital personnel.

The plan, as presented here, is not original; it represents a combination of elements of the Herner report (2), work being carried on in New York State by Pizer (1, 6) and in Detroit by Pings (7), as well as the employment of survey methods developed by the Institute for the Advancement of Medical Communications in Philadelphia (4,5).

It envisions a much firmer relationship among participating librarians than presently exists nationwide, as well as a far stronger administrative responsibility for the National Library of Medicine than it has now, or may be willing to assume.

The plan, in contrast to others, relies less on technology and more on humans as the link between information and the user; considering the present state of technology and the cost involved in developing and maintaining reliable mechanized communications systems, this is considered essential for some time to come.

Our focus, in presenting this plan, is primarily on the practicing physician. Researchers, faculty members and students will benefit equally by being affiliated with institutions which house members of the envisioned library network.

The physician, however, is usually physically removed from such an institution, and does not have easy access to library resources, not is he knowledgeable about their availability. He does not have time to undertake information searches, nor does he know about the different sources of information available to him.

We therefore suggest the local library as his primary information source, both for the provision of documents and as a switching center for information needs beyond the scope of the local library. We do not feel that the library can be successful in this unless it examines its philosophy of service in terms of user needs and makes certain choices.

As we see it, libraries have several choices:

They may continue to consider document provision as their primary responsibility, leaving specialized information services to other agencies.

They may choose to become switching centers for all of the information needs of their patrons; providing referral service for all those requests which they cannot or will not undertake to fulfill.

They may provide some of the services of an information center, as well as traditional library services, providing referral services for anything beyond their scope of services.

They may become hosts to full-fledged information centers; while at the same time providing traditional library services.

Obviously, the choice depends not only on the library philosophy of both the administration and the librarian, but also on geographic, financial, and staff considerations, as well as on the size and mission of the library.

Before we examine some of these, we need to define what we mean by "information center":

There are, in the opinion of this writer, a number of basic requirements that any information center, regardless of subject matter, must fulfill:

1. It must be able to assess the needs of its users, both current and potential, by accurate, realistic methods, and must develop its services accordingly.

2. It must engage in a meaningful and continuous dialog with its users, with formal feedback channels firmly established, and aggressively advertised.

3. It must clearly differentiate between the need for documents and the need for information. A document service must provide needed materials to its users at the time they are needed or as soon after as financially possible, and in the form needed, including non-print materials. For the kind of information service considered here the following are needed:

a. A collection of materials adequate for the day-to-day needs of its users, not necessarily large, but supported by resources outside the library.

b. A staff skilled in interrogating users about their information needs, search strategy, knowledge of bibliographic tools, (both traditional and new), and non-conventional sources of information. Staff members must be skilled in synthethizing information, and providing translations. A rudimentary knowledge of the subject field is considered essential.

c. A means of rapid communication with clientele outside the institution, both with individual physicians and other libraries.

4. An information service must recognize that one of its major responsibilities lies in education for all classes of users. It is necessary to teach something of information transfer theory, the forms in which information appears, and the optimal techniques for using the various forms. This teaching function must be on the intellectual level of the user, so that he may receive maximum benefits from it.

If these requirements are accepted as basic, we must next examine any special requirements present in the biomedical community, as opposed to other scientific groups, which may present particular problems for information services.

The user group in the biomedical field has been described before; however, a number of recent developments should be mentioned here which influence the direction in which information services might develop:

1. There is an increased emphasis on continuing education for physicians; the American Academy of General Practice requires proof of courses taken by the physician before it will admit or maintain a member. The Regional Medical Programs have stimulated planning in this area; with formal affiliations of practicing physicians with medical centers on a continuing basis being only one of the ways of upgrading medical practice.

2. Increased attention is being paid to the education of paramedical personnel; teaching programs for the various specialties have sprung up in medical centers around the country in increasing numbers, and many of these are being coordinated by full-time directors with major responsibilities for the planning and implementation of extramural programs as well.

3. Increasingly, physicians are banding together in groups, with shared facilities and expertise. It is not known to what extent this is true in rural areas, but it should be remembered that only approximately 11 per cent of all physicians in private practice are located in areas not contiguous to metropolitan centers. This would seem to be a major consideration in the provision of information services to practicing physicians.

4. There is not a great deal of difference between students, teachers and researchers in the biomedical field as compared to these same groups in other areas. However, the needs of the practicing physician do require a different approach. He is daily confronted with a series of diagnostic findings, which he must support by his own

knowledge as well as acquired information. This information must be easily locatable and must cover an extremely wide range. Time limitations are crucial and a physician, as opposed to the researcher, teacher or student, should not be expected to know the various sources, formats and kinds of information. Therefore, information should flow to him, preferably from a single source, easily, quickly, and in the form in which he needs it. If the library is to become this "single source", several problems will need to be solved. Some of these were discussed before; additional ones are mentioned here:

1. Geographic considerations: Because of the uneven distribution of biomedical collections, no single approach to information provision will suffice for all of the states. Existing cooperative patterns, current developments under the Regional Medical Programs and the Regional Library programs must be taken into consideration. For example, the state of New York, already rich in biomedical information resources, has taken several significant steps toward improvement in library services; there are other areas in the country where few cooperative patterns have developed and resources are meager. It would appear that additional study is needed before patterns of cooperation are fixed or even suggested. Libraries should be surveyed to ascertain:

   a. From which libraries they borrow (names of libraries, listed in order of importance)

   b. To which libraries they lend (names of libraries, listed in order of importance)

   c. To what extent and which other sources of information they use, and for what purpose (Information centers, other types of libraries, national referral center for Science and Technology, MEDLARS, etc.)

d. What cooperative acquisitions agreements they have entered into with nearby libraries, including non-medical ones.

Among the libraries surveyed should be included all categories of libraries listed before, including hospital libraries. The survey should be channeled through the various professional organizations (AMA, National League of Nursing, American Hospital Association) which have both the machinery and the rapport with their members to make a high return possible.

Given the results of this survey, some very meaningful patterns could be established, weaknesses would appear much more clearly than at the present time, and a proposed network could be presented to groups of medical librarians for discussion by means of regional workshops. This activity should be under the auspices of, and conducted by, the National Library of Medicine.

2. User considerations: Little is presently known about libraries' current clientele and nothing about potential users. The library community has based most of its planning either on traditional concepts of what a library ought to do or on pragmatic decisions made locally and based on user demands if such have appeared. It is necessary to survey each library's user community, both present and potential, in order to plan for realistic library development. The Institute for the Advancement of Medical Communication has developed sound methods for measuring users' information habits, both inside and outside the library. IAMC has also designed an instrument which

measures library services both in terms of official library policy, and what actually takes place in day-to-day operations.[1] (4,5)

Libraries should be required to use both of these instruments for self-surveys; training for the administration of the tests could be given at the workshops mentioned above. Federal grants should not be awarded to any library which does not complete the self-survey, and all should be encouraged to use them annually to measure progress. The results of these self-surveys should be submitted to the National Library of Medicine where they could be evaluated and analyzed for planning regional library patterns. A byproduct of the survey would be knowledge about the extent of direct service to physicians; this data is surely necessary for any meaningful planning.

Both the instruments mentioned above would, if administered properly, give information about present direct services to physicians, as well as information about physicians' information habits far beyond what is known today. Under the Regional Medical Program, at least one state[2] plans a comprehensive survey of physicians in the state to assess their feelings toward, and need for, continuing education. This survey, most likely being developed for many of the Regional Medical Programs, should include the IAMC User Survey, (modified for use by physicians), as an integral part, thus giving both RMP personnel and librarians a common planning base. The same survey, if collected from all states and analyzed, would give a firm data base for the planning of a biomedical information system unlike anything presently available.

---

[1] For a description of IAMC's work, see Appendix A.

[2] Mississippi

3. Staff considerations: As stated above, librarians have traditionally assumed a somewhat passive role in the provision of library services, basing most of their activities on traditional concepts. If the role of the library is to be more than a document delivery and fact-finding service, it will become necessary to effect some drastic changes in library philosophy.

These changes must come not only on the librarian level but on the administrative level as well. Libraries have been considered as "overhead", or as part of administrative functions in institutional budgeting; it was thought that cost-effectiveness ratios could not be established for library programs, that libraries could not show "a profit", as it were, and librarians have done their part to encourage this thinking by their unwillingness or inability to measure their services in meaningful terms. They have continued to collect statistics on number of volumes circulated, number of inter-library loans, number of patrons entering the library, and similar activities. None of these figures provide a meaningful assessment of the relative importance or effectiveness of the library in its own institutions or region, nor do they assess the unmet needs of its clientele.

Librarians should enter into a firm and close partnership with their users, should become "part of the team", and might thereby achieve equal status. This can only happen if librarians develop a deepening concern and healthy respect for their users' information habits and needs as well as rudimentary knowledge of medicine and allied subjects. They should develop the ability to see the library as a "black box"; a much-overused term, it does, nonetheless, provide a graphic concept of an information unit which is judged solely on performance, and whose inner workings are of no concern to the user and should be of less concern to the librarian insofar as they are based on tradition rather than user needs. An example is the claim by librarians to know how best to organize the collection for optimal use, when, in fact, little is known of its effectiveness to the user. The variations in cataloging and classification between different libraries, the physical separation of different forms of information sources (microfilm in cabinets, bound journal volumes of the same title on shelf) present considerable obstacles to the user. The absence of government reports and documents, non-print material and the like from the collection, do not allow the user a choice of the full range of information materials. Organization of all library activities must be aimed at dynamic service alone, at whatever level needed locally, and with whatever size and type of collection, cooperative arrangements, referral services and all the rest, which will achieve a high-level of service.

Because users are generally unaware or know very little of all the library has presently to offer, or is planning for the future, an aggressive advertising and teaching program should be part of the dynamic interchange between users and library staff. At every staff level, library employees should be trained to volunteer information to the user, rather than await his request. Written materials should continuously and redundantly inform all present and potential users of all the services available from the library. Oral presentations, both formal and informal, to all users should be planned on a continuous basis and on various levels of sophistication for continuing education in information work.

4. Financial considerations: Lack of adequate financing is, of course, the reason most often cited for not performing most or all of the desirable information services. Librarians should adopt a businesslike marketing approach; in industry a new product is developed, market-tested, and then sold to customers. Librarians can develop pilot services, market-test them on a small group of users, improve them, based on user feedback, and sell them to the entire user group, if the services have found acceptance with the small group. Word will spread quickly throughout the user community if the service is needed and useful, aggressively advertised, and provided on the basis on which it was advertised. Administrative support will be found if the user group accepts and likes the service. A certain part of each library's budget should be set aside for just such experimental programs each year; included in the budget estimate for such a program should be a considerable amount for promotion of the "product" so that every present and potential user will have an opportunity to know about it and avail himself of the service. Federal assistance will, of course, continue to ease the financial burden and stimulate new programs as well as strengthen ongoing ones. A percentage of research

grants set aside for library support would help greatly in those institutions which conduct research activities.

5. Problems in cooperation: Because cooperative arrangements have, in the past, been based on courtesy and voluntary agreements, it was difficult to formalize them. As described above, this trend is changing toward much more formal organization, with payment for services rendered and responsibilities of all partners clearly spelled out. In any system or network it is necessary that all members' responsibilities be made explicit, and, more importantly, that information about these obligations be disseminated to all partners. This might occur in two ways: by means of regional workshops offered by the reservoir library, and through repeated visits by consultants from this library to reinforce staff understanding and acceptance, and inform them of changes and developments within and outside the system, likely to affect local operations.

Probably the best existing example of what is described above is the medical library network which exists among health science libraries in the Detroit area and was spearheaded by Vern Pings, librarian at the Wayne State University School of Medicine. The studies conducted by him and his staff members were mentioned before and are listed in the bibliography; based on findings of these reports, which measured everything from Pings' library's performance to the availability of library resources to postgraduate medical students, he established an informal network among the libraries in Detroit. His library is now a "librarian's library"; few users come directly but most are served through local hospital libraries and other outlets. Hospital librarians have been thoroughly trained in providing limited information service, and, more importantly, to know at what point to approach the Wayne State Medical Library for services which they are not trained to deliver. Continuous feedback, both from librarians and users, is part of the system, and it appears to be very successful. It should be stated that the network provides only traditional library services at this time, but optimum performance of document delivery and bibliographic service is only the first step in any information system. Once this operates smoothly, the group of librarians, having learned to work together well, and in clearly defined relationship, will no doubt go on to other services. An example of established patterns being accepted by an increasing number of librarians is MICES, the teletype "network" among medical libraries of North Carolina, Virginia and Kentucky. The basis of this "network" is an operations manual, agreed to by medical librarians in the states listed, who met together and agreed to accept it as operating procedure. Numerous libraries have since "joined", that is, they have installed TWX and announced to the medical library community that they would follow procedures as outlined in the MICES manual. There are no other requirements for "belonging" to the network; the common agreement is all that binds them together. The New York Medical Center accepted the manual with almost no changes, and no doubt it is being used elsewhere as well. The point is, of course, that informal cooperation has yielded to a more formal relationship;

each library which agrees to the procedures must meet certain requirements and does so for its own benefit as well as the benefit of other participating libraries.

None of the above suggestions are unrealistic; all have been carried out successfully elsewhere. The instruments for user study and the library service inventory exist and are being used in a number of medical libraries now, with excellent results. An inventory of inter-library policies is also being developed by the IAMC and is available for us. Librarians in technical information services, both in academic and company libraries, have long been considered partners in research by their colleagues and have developed to a very considerable degree the dynamic information services which are needed for optimum service to their users. An excellent example is the aggressive, flexible, and very successful information service offered by Southern Methodist University Library, under the sponsorship of the State Technical Services Act (3). At SMU's Science Information Center a small group of highly competent librarians will go to any length to obtain needed information from any source for their industrial clients. The service is described and advertised by means of a regular newsletter, articles in house organs, seminars, workshops, visits to clients, and other avenues. User feedback is an integral part of this service, and it is flexible and responsive to them. The Science Information Center is partly financed by government funds but has attracted increasing amounts of support from industry as it has grown in stature and usefulness. There are many other examples of such services; SMU's center is merely cited as one example of what can be done, given imagination, enthusiasm, and a real commitment to service on the part of staff.

Having described some of the problems and some possible solutions, we next examine the various ways in which a biomedical library might fit into a national biomedical information system.

Perhaps the basic difference between this writer's approach and that of most of the existing plans is the "approach from the bottom up". Because our focus is so strongly on the user, wherever he may be, it seems reasonable to begin a proposed system with his primary library, that is, his nearest or most convenient source for information. This may be his office library, or it may be the library of the New York Academy of Medicine; it could be a VA library in Wyoming or a hospital library in Chicago. It could very well be the biomedical library on the University of Chicago campus, rather than the medical librar y in Evanston, where he now practices. It could even be the mailbox- if he is a member of the Texas Medical Society, which operates a library service by mail. Because we know so little about our users's library habits, and because our user knows so little about library resources available to him, we need to make certain assumptions in designing a system for him.

1. Our physician is in private or group practice, in most cases in or near a metropolitan area. His patients are in one or more local hospitals and he makes daily rounds. He increasingly looks to the hospital for the provision of continuing education activities, such as courses, lectures, seminars and the like.

2. He would like to fulfill his information needs in the easiest and most time-conserving manner, preferably from a single source.

3. He is relatively unskilled in the use of information tools and does not really want to learn how to use them - he is interested only in answers to his questions.

4. His interests may range from diagnostic information to acquiring background in an unfamiliar area, from psychology and patient counselling to medicolegal problems, and from office procedures to the optimum layout for a laboratory.

5. He will only accept services which are demonstrably better than present ones, and which - most importantly - save him time.

Because of the need for saving time, for obtaining custom-made answers for his questions, and because of his increasingly close relationship with the local hospital, we are suggesting that the physician's primary information source be the library in the local hospital.

1. Primary Library: The local hospital library should supplement, and partly assume responsibility for, the physician's information needs. He should be able to find, in this library, Index Medicus (the soon to be published abridged version), 100 basic medical journals and the same number of basic textbooks (both from an approved list, and the same in all hospitals). He should also be able to find a well-trained person, who would provide him with a means by which he may obtain, quickly and free of charge, factual information needed for diagnosis, information on drugs, the toxicity of various compounds, review articles,

state-of-the-art reviews and all the other kinds of material needed in his daily work. This person would not be expected to have this material, nor would she be expected to know a great deal about the subject in question; she would, however, be trained to fill out a carefully designed form which would elicit from the physician all the information needed to fill his request, if he was unable to find it himself in the local collection. This she would be expected to do either via telephone or in personal confrontation. She would be instructed to telephone this request, (without attempting to fill it from her existing collection), to her district library, where a small unit within the library would be available on a full-time basis to receive calls. Members of this unit would advise the local library assistant by suggesting a source in her own collection where the information is to be found, or would inform her that the request would be researched and that she would receive an answer back the same day, which she would be expected to relay to the requestor. This answer could consist of the information that the material has been copied and is on its way, or that it was requested from another library, which would mail it directly to the physician, or that it would be telephoned directly to the physician, if the information is of such technical nature that the local library assistant cannot be expected to relay it correctly.

The library function described above would be carried out by a small hospital library, staffed by untrained personnel. However, this library would not be 'accepted' into the network, until a firm commitment for support from the hospital administration was obtained. This commitment would consist of obligating funds to pay a person for a certain number of hours per day, to be agreed upon by the local physician group, and on a full-time basis. This person would have no other duties, such as maintaining medical records, secretarial work, etc. Funds would also need to be committed for maintaining the collection, once it is installed. Journal subscriptions would be maintained, as well as a certain number of books acquired each year. The initial collection would be delivered, fully cataloged, to the local library, once the commitment was made. The installation of a telephone, connected to the district library by WATS service, would be required, as would allotments of travel funds for the library assistant to attend workshops and meetings.

The library assistant would be supplied with lists of books to buy, catalog information for these in the form of cards and spine labels, manuals of operation for her work, and information dissemination tools for the library, which would be regularly distributed by her to all physicians.

She would be expected to attend workshops on a regular basis, preferably quarterly, to learn proper techniques for serving her clientele, and to understand thoroughly the relationships which exist between her, the district library, and other libraries.

2. District Library: The District Library might be any of the following types of libraries:

Large hospital library
Medical School Library
Health Sciences Library
Public Health Library
Medical Society or Academy Library
VA Library

In order to qualify as a district library, the collection should number approximately 45-50,000 volumes and should be staffed by at least two professionally trained librarians, a third would need to be employed when the library is named a District Library. This library should be geographically so located as to be fairly well accessible to all the hospitals it serves. This would, of course, depend on geographic location, and would differ from one area to another. The area served might well cross state lines if the library were located close to the border of one state. The delineation of its district might also be correspond to that of a Trade Center, that is, the Trade Center District Library would be located in a city to which surrounding areas naturally gravitate for shopping, cultural attractions, continuing education and the like. Established relationships should also be taken into consideration, if such exist, and data are available.

It would be the responsibility of the District Library to furnish local hospitals in the area with quick, efficient back-up service for any and all requests, to be, in effect, a switching center for information of all kinds. This would not mean that it would own all that is needed; it would, however, be connected by electronic means with its Reservoir Library from which it would obtain everything needed in its district. Much of the training of local hospital library personnel would be carried on at this level; the training of the instructor-librarians would be provided from the Reservoir Library. The District Library would have a traditional collection of books and journals; it would also own, in microform, package libraries of additional journal titles, technical reports, and selected groups of non-print media. It would have facilities for reproducing hard copy from microfilm.

Its Hospital Library Service staff would consist of at least one professionally trained librarian, who would be highly skilled in knowing the resources and bibliographic tools of her own collection, as well as the services available from the Reservoir Library. She would attend regular workshops there and would be aided in her work by regular visits from consultant-librarians from the Reservoir Library.

The preparation of beginning collections for hospital libraries would be the responsibility of the District Library; these would be delivered, ready for shelving, to the individual hospitals. It would furnish lists of books and journals that are to be purchased by the hospital library and sets of catalog cards, spine labels, and the like, so that the local library assistant would not need to learn how to organize the collection. A thorough knowledge of the hospital collection would be essential for the District Library Hospital Library Services staff so that the local assistant may be instructed, via telephone, how to find information.

WATS line service would connect all participating hospitals with the District Library, which would possibly need to man more than one telephone for quick efficient service.

3. The Reservoir Library: This library would be designated on the basis of the excellence of its present collection, its services, the competence of its staff, and its geographic location. It might be any of the kinds of libraries listed above, or a large special library such as John Crerar Library in Chicago.

It would serve a multi-state area with document provision and in-depth information services. All Reservoir Libraries would be linked together by electronic means; they would also be linked to major information centers in the country, and to the National Library of Medicine.

This library would provide in-depth information services of the kind described earlier in this chapter. These services would be available from a special Extramural Unit solely responsible for District Library Services. This unit would need to be staffed by highly competent individuals who have absolved a training course at the National Library of Medicine. The course would consist of training in search strategy, machine searching of tapes (including a brief unit on MEDLARS searching), study of user habits and needs, teaching methods, including programmed learning, and similar subjects. They would be expected to perform at a very high level of sophistication when providing information services, as well as performing the extremely important teaching function necessary to impart a knowledge of basic services to District librarians. A number of consultants would be employed by this unit and would travel to the District Libraries regularly, assisting with problems and teaching functions. This unit would also be responsible for holding workshops and seminars for District library personnel responsible for hospital library service.

Depending on geographic location, the Reservoir Library might well include specialized Information Analysis Centers, such as those presently located at Columbia, Johns Hopkins and University of California, and operated by the Neurological Information Network (8, 9). It would be a MEDLARS search center, and it would own Chemical Abstract tapes, NASA tapes, and similar material. It would have staff capable of preparing translations, review articles, and recurring bibliographies.

Material for the individual physician would be prepared here; he would receive a regular newsletter announcing all the services available from the reservoir, district and local level, apprising him of new publications via critical reviews, and informing him of information tools and services available from commercial firms. This material would be distributed to the District Library, and from there to the Primary Library. It would frequently contain user survey forms to assess present services in terms of usefulness, speed, accuracy, and accessibility. It would employ physicians to prepare feature articles describing new findings, services, and publications and their applicability to local needs. It would also solicit contributions of articles from its clientele and from the District Libraries in its service area.

Depending on the acceptance of this medium by the physician group, the newsletter can become a means of soliciting interest profiles from those physicians who wish to keep up with certain subject areas. Custom bibliographies on a recurring basis and SDI-type services may be established for them as the need arises. If such information is to be distributed to individuals, it should always be accompanied by location data. Each recipient should be told not only where the information is located, but also, how quickly it can be made available to him, and by what means.

The Reservoir Library would provide referral services for items not owned, or information not obtainable from its own staff members, to other types of libraries and information centers. It would enter into agreements with these, so that information and documents would be sent directly to the physician from the agency where the item is available.

It would receive large files of journals and out-of-print books on microfilm from the National Library of Medicine and other Reservoir Libraries, so that optimum document service would be provided without referral. The Reservoir Library would accept little-used materials from District Libraries, discarding unneeded items. District Libraries would maintain current, user-oriented collections only, while the Reservoir Library would become as self-sufficient as possible, ensuring that almost all of the requests from its District Libraries could be filled from its own staff resources or collection. It would maintain Union Catalogs of District Library holdings and might also acquire such catalogs from other Reservoir Libraries.

4. The National Library of Medicine: This library would provide all the services it is presently providing, but Interlibrary Loans only to Reservoir Libraries and to those specialized information centers not part of a library. It would cease to be the resource library for the District of Columbia and surrounding areas, thus freeing staff and funds for service activities to benefit the library system. It would increase its microfilming project and assign responsibility for additional microfilming to Reservoir Libraries, owning titles not owned by NLM. It would prepare training materials for Reservoir Library personnel and carry on training courses for them. Additional training material, on a less sophisticated level, would be prepared for District Library personnel, and local hospital librarians. Having all teaching materials prepared in a central place insures that relationships are established on a uniform basis, and a philosophy of service can be developed which all system members accept alike.

Depending on the availability of funds, the National Library of Medicine could supply Current Catalog tapes to Reservoir Libraries, which would provide computer-operated centralized processing service for all District Libraries and local hospital libraries. Another possibility might be to locate unit record equipment in District Libraries, and have catalog cards printed on this equipment, using decks of cards supplied by Reservoir Libraries, and prepared from

Current Catalog tapes. In order to provide comprehensive centralized processing service, microfilm would need to be cataloged by the National Library of Medicine, or L.C. cataloging information for microfilm adapted to NLM classification.

Yet another possibility is to rely solely on catalogs in book form, with inventory information stored in the Reservoir Library's computer, and custom-printed book catalogs distributed on a regular basis to all District Libraries. Local libraries would still need to receive catalog cards, either from the Reservoir or the District Library, because it would not be economical to prepare and update small book catalogs for them.

Little has been said about the means by which the library system would be linked together. This depends on the availability of funds; very large sums of money would need to be committed if anything but teletype and WATS service were considered. For the present time, both of these means would provide adequate service, provided that it is clearly understood by all participants that this equipment would need to be manned at least eight hours each day so that requests may be relayed as soon as it has been ascertained that they cannot be filled by the library which received them.

If all Reservoir Libraries had library-owned computers, they might be linked to all the other Reservoir Library computers and the equipment at the National Library of Medicine, provided all are compatible. This linkage would provide a much more powerful communications system than teletype, but it is also far costlier and can probably not be attained for some time. It is not considered feasible to attempt computer linkage if the computer is not library-owned, unless a very powerful, time-shared computer is available to each Reservoir Library, with files directly accessible at all times.

Experience with telefacsimile thus far has not shown that it is economically feasible for libraries to operate such a system. It is conceivable, however, that in the future the equipment will be improved and the cost will drop to such an extent, that Reservoir Libraries could be linked in this manner.

A more promising means of transmittal is videotape; not only can it be sent over long distances via soon to be established ETV network communications, but videotape can be indexed for retrieval, thus making it possible to distribute files of journals to Reservoir Libraries, from which articles may be retrieved via computer, printed and sent directly to physicians. These same videotapes could be sent to District Libraries where they could be used for closed-circuit television broadcasts directly to the physician's office or home. Because of the versatility of this medium, its applicability to library storage and retrieval should be studied thoroughly.

Summary: In the last few pages, several problems were described which presently stand in the way of achieving optimum service to the user. Provided that data are gathered, which are needed for planning, and that librarians examine their present practices critically in the light of these data, it is proposed that health science libraries become active members of a biomedical information system designed to serve the practicing physician.

Four levels of service are envisioned:

1. Primary Library: The local hospital library would be the physicians' major source for all types of information. It would not own a large collection, nor would it be staffed by a trained librarian, but it would have a basic collection to satisfy immediate needs. Its personnel would be thoroughly trained to obtain from the physician all the information needed to answer his question.

2. District Library: The District Library would be of medium size, but would have a small staff unit solely dedicated to serving local hospital libraries. All requests from there would be communicated via WATS telephone line and would either be filled immediately from the collection, or the local library assistant would be instructed where to find the information in her own small collection. If neither library had the resources to fulfill the physician's needs, it would be referred to the Reservoir Library.

3. Reservoir Library: This would be a very large library serving several states. It would attempt to accumulate a comprehensive and self-sufficient collection, relying on other sources only for borderline subjects. It would provide highly specialized information services to its District Libraries, as well as teaching and consultant services. Written material would be prepared here, which would be distributed by the local library to the physician. This material would review information materials, and inform the physician of all the services available from the various levels.

It would provide referral service to other types of libraries and information centers, which, under contractual agreement, would provide the needed information directly to the physician.

4. The National Library of Medicine: This library would continue all of its present services, but would make them available only to Reservoir Libraries and other types of non-medical libraries, as well as specialized information centers. This would relieve the burden of heavy interlibrary loans, and would free staff and funds for other needed activities. These would include: Training of Reservoir Library staff, preparation of printed teaching materials, establishing and disseminating guidelines, procedures, and definitions of relationships between the other three levels of libraries, providing catalog information in machine-readable form, and expanding its microfilming activities so that duplicate files may be distributed to Reservoir Libraries.

District, and Reservoir Libraries would be linked to each other and to the National Library of Medicine by communications terminals. These may or may not be connected to computers, depending on their availability at the Reservoir Libraries.

The use of videotape is thought feasible in the future and its application to library use should be investigated.

If a system of this kind were established, the country's information resources would be available to the physician quickly and from a single source. The human interface, considered essential for saving him time, would be an essential component of this system at every level, while technology would be used whenever and wherever it is economical and improves services. The entire system is user-oriented, based on analysis of the user population, and responsive to feedback from him.

LIST OF REFERENCES CITED

1. Cain, Alexander M. and Irwin H. Pizer
The SUNY Biomedical Communication Network: Implication of an On-Line, Real-Time, User-Oriented System. (Paper presented before the Annual Conference of the American Documentation Institute, October 1967). (Unpublished Draft).

2. Herner and Company
A Recommended Design for the United States Medical Library and Information System, v.I and II. rev. ed. Washington, 1966. (NSF-C-442, PB172 924, v.2).

3. Industrial Information Services Newsletter, v.I, no. 1 - 1966 - (various issues) Science Information Center, Southern Methodist University, Dallas, Texas.

4. Institute for the Advancement of Medical Communication
Six-Month Progress Report. Philadelphia, January 14, 1967. (Contract PH 43-66-540). (Privileged communication).

...., Second Progress Report, covering period 1/1/67 to 3/31/67. Philadelphia, April 19, 1967. (Contract PH 43-66-540). (Privileged communication).

...., Third Progress Report, covering period 4/1/67-7/31/67. Contract PH43-66-540. Philadelphia, August 14, 1967. (Privileged communication, not to be released without the Institute's authorization).

5. Orr, Richard H., Vern M. Pings, Irwin H. Pizer, and Edwin E. Olson
Development of Methodologic Tools for Planning and Managing Library Services: Part I : Project Goals and Approach. (Unpublished manuscript, submitted to the Bulletin of the Medical Library Association for publication).

6. Personal Communication from Irwin H. Pizer, Director, SUNY Biomedical Communications Network, Syracuse, New York, dated January 10, 1968.

7. Pings, Vern M.
Regional medical library program. (Unpublished draft).

8. U.S. National Institute of Neurological Diseases and Blindness.
NINDB Neurological Information Network: Annual Progress Report, October 1966. Bethesda, Md., 1966.

9. U.S. Public Health Service
The Neurological Information Network of the National Institute of Neurological Diseases and Blindness. Government Printing Office, 1967 (PHS pub. no. 1691).

BIBLIOGRAPHY

An Act to Amend the Public Health Service Act to Provide for A Program of Grants to Assist in Meeting the Need for Adequate Medical Library Services and Facilities. Public Law 89-291, 89th Congress, S.597, October 22, 1965. College and University Reports, CCH Special 77.

Adams, Scott
Hospital Libraries: Underdeveloped Base for Continuing Education. Hospitals 38:52-54 (1964).

Adams, Scott
Medical Library Resources and Their Development. Journal of Medical Education 38:20-27 (1963).

American Medical Association
Distribution of Physicians in the U.S., 1965. Regional, State, County, Metropolitan Areas. Chicago, 1967.

Annan, Gertrude L.
Medical Librarianship in the United States: Resources and Trends. Bulletin of the Medical Library Association 50:149-158 (1962).

Annan, Gertrude L.
Regional Plans for Medical Library Service: New York State and the New York Metropolitan Area. Bulletin of the Medical Library Association 52:503-508 (1964).

Auerbach Corporation
DOD User Needs Study, Phase I. Philadelphia, May 1965. (AD 615501)

Berman, Leon C.
A Design for Continuing Medical Education. Journal of Medical Education 41:965-958 (1966).

Bloomquist, Harold
The Status and Needs of Medical School Libraries in the United States; a report prepared for the National Library of Medicine. Boston, October 1962. 30p.

Buerki, Robin C.
The Increasing Role of Paramedical Personnel. Journal of Medical Education 40:850-855 (1965).

Cain, Alexander M.
Steps Towards a Computer-Based Library Network. Bulletin of the Medical Library Association 55:279-289 (1967)

Cain, Alexander M. and Irwin H. Pizer
The SUNY Biomedical Communication Network: Implication of an On-Line, Real-Time, User-Oriented System. (Paper presented before the Annual Conference of the American Documentation Institute, October 1967). (Unpublished Draft).

Cahn, Julius N.
Closing the Gaps in Biological Communications. Federation Proceedings 22:993-1001 (1963).

Campbell, James A.
The Library's Impact on Medical Education. Bulletin of the Medical Library Association 41:7-11 (1953).

Canadian Library Association
A Brief Presented to the Royal Commission on Health Services by the Committee on Medical Science Libraries. Ottawa, April 1962. 16p.

Clark, Gertrude M.
The Medical Society Library; symposium on types of medical libraries, pt. IV. Bulletin of the Medical Library Association 43:193-198 (1955).

Clausman, Gilbert J.
Regional Cooperation in New York. (Unpublished talk before the Southern Regional Group of the Medical Library Association, presented on October 14, 1967 in New Orleans).

Communication from the President, Foundation for Medical Library Communications, Inc., dated October 17, 1967, including Information on Telebiblios, a planned medical information retrieval system.

Communication Problems in Biomedical Research; report of a study. Federation Proceedings 23:117-1176 (1964).

Crawford, Helen
Regional Plans for Medical Library Service; Proposal for an expanded medical library extension service for Wisconsin. Bulletin of the Medical Library Association 52:514-520 (1964).

Darling, Louise
Summary of Information in Questionnaires on Grant Aid to Medical School Libraries. Bulletin of the Medical Library Association 46:191-193 (1958).

Dean-Throckmorton, Jeanette
State Medical Libraries; symposium on types of medical libraries, pt. V. Bulletin of the Medical Library Association 43:199-202 (1955).

Deitrick, J. E. and Berson, R. C.
Medical Schools in the United States at Mid-Century. McGraw-Hill, 1953.

Divett, Robert T.
There's Nothing Like Pushing A Button. Bulletin of the Medical Library Association 55:325-328 (1967).

Dryer, Bernard V.
Lifetime Learning for Physicians: Principles, Practices, Proposals. Journal of Medical Education 37: June 1962, pt. 2 (entire issue).

The Economics of Periodical Storage, in Modern Periodicals on Microfilm (catalog). Ann Arbor, Michigan, University Microfilms, n.d. p.61-62.

Esterquest, Ralph T.
Regional Plans for Medical Library Service. Bulletin of the Medical Library Association 52:497-498 (1964).

Esterquest, Ralph T.
Regional Plans for Medical Library Service: The Countway Library Plan for Regional Medical Library Service in Northern New England. Bulletin of the Medical Library Association 52:521-523 (1964).

Esterquest, Ralph T.
Strengthening Medical Library Resources in New York State. Albany, State University of New York, 1963. 30p.

Felter, Jacqueline W.
The Medical Library Center of New York: A Progress Report. (Unpublished manuscript, to be published in Bulletin of the Medical Library Association, January 1968).

Fogarty, John E.
Medical Libraries and Medical Research. Journal of Medical Education 41:73-80 (1966).

Giesler, R. H. and Yast, H. T.
A Survey of Current Hospital Library Resources. Hospitals 38: 55-57 (1964).

Goodall, Archibald L.
The Place of the Librarian in the Medical Team. Bulletin of the Medical Library Association 43:19-22 (1954).

Guidelines for Medical School Libraries. Journal of Medical Education 40, pt. I:1-61 (1965).

Harris, Jerome J.
Survey of Medical Communications Sources Available for Continuing Physician Education. Journal of Medical Education 41:737-755 (1966).

Health Science Libraries of National, State and Local Medical Organizations. Bulletin of the Medical Library Association 55:191-200 (1967).

The Health Sciences Library; its Role in Education for the Health Professions. Report of the Library Study Committee of the Association of American Medical Colleges to the National Library of Medicine. Journal of Medical Education 42:pt. 2 (1967) Entire issue.

Herman, Flora E.
The Public Health Library; symposium on types of medical libraries, pt. VIII. Bulletin of the Medical Library Association 43: 212-216 (1955).

Herner and Company
A Recommended Design for the United States Medical Library and Information System, V.I and II. rev. ed. Washington, 1966. (NSF-C-442, PB172 924,V.2).

Herner, Saul
Information Needs and Uses in Science and Technology, in Annual Review of Information Science and Technology, v.2. Interscience, 1967, p. 1-34.

Hetzner, Bernice M.
Regional Plans for Medical Library Service: The Nebraska Plan for Medical Library Extension Service. Bulletin of the Medical Library Association 52:499-500 (1964).

Hyman, Richard J.
Medical Interlibrary Loan Patterns. Bulletin of the Medical Library Association 53:215-224 (1965).

Indiana Installs Teletype Facility. Bulletin of the Medical Library Association 55:237-238 (1967).

Industrial Information Services Newsletter, v.I, no.1 - 1966 - (various issues) Science Information Center, Southern Methodist University, Dallas, Texas.

Ingelfinger, Franz J.
Austere Librarians - Volte Face! Bulletin of the Medical Library Association 55:1-4 (1967).

Institute for the Advancement of Medical Communications:
Six-Month Progress Report. Philadelphia, January 14, 1967 (contract PH 43-66-540). (Privileged Communication).

.... Second Progress Report, covering period 1/1/67 to 3/31/67. Philadelphia, April 19, 1967. (Contract PH 43-66-540). (Privileged Communication).

.... Third Progress Report, covering period 4/1/67-7/31/67 (Contract PH 43-66-540. Philadelphia, August 14, 1967 (Privileged communication, not to be released without the Institute's authorization).

Jeghers, H.
Medical Care, Education and Research. Philosophy and Technics of Self-Education of the Medical Student and Physician. New England Journal of Medicine 271:1297-1301 (1964).

Keenan, Elizabeth L.
Interlibrary Loan, 1952-62; ten years of progress? Bulletin of the Medical Library Association 52:307-315 (1964).

Keenan, Elizabeth L.
Medical Library Statistics. Bulletin of the Medical Library Association 53:196-203 (1965).

Keenan, Elizabeth L.
Medical School Library Statistics. Bulletin of the Medical Library Association 52:386-409 (1964).

Kent, A.
Computers and Biomedical Information Storage and Retrieval. Journal of the American Medical Association 196:927-932 (1966).

Kilgour, Frederick G.
Regional Plans for Medical Library Service: Regional Library Services of the Yale Medical Library. Bulletin of the Medical Library Association 52:501-502 (1964).

Kilgour, Frederick G.
Use of Medical and Biological Journals in the Yale Medical Library, pt. I and II. Bulletin of the Medical Library Association 50: 429-499 (1962).

King, Louise D.C.
Availability of Medical Library Service (letter to the editor). Bulletin of the Medical Library Association 44:488-489 (1956).

Leake, Chauncey D.
The Role of the Medical School Library in the Medical School Teaching Program. Bulletin of the Medical Library Association 41:369-378 (1953).

Library Statistics of Schools in the Health Sciences, Pt. I. Bulletin of the Medical Library Association 54:206-229 (1966).

.... pt. II. Bulletin of the Medical Library Association 55:201-202 (1967).

Marshall, Mary Louise
Library Standards; A Symposium. Bulletin of the Medical Library Association 51:63-87 (1963).

Mase, Darrell J.
The Role of the Medical Center in the Education of Health Related Personnel. Journal of Medical Education 42:489-493 (1967).

Medical Library Association. Hospital Group
Objectives and Standards for Hospital Medical Libraries. Bulletin of the Medical Library Association 40:384-387 (1952).

Medical Library Association. Hospital Group
Objectives and Standards for Nursing School Libraries. Bulletin of the Medical Library Association 40:394-397 (1952).

Medical Library Resource Grants. Bulletin of the Medical Library Association 55:527-532 (1967).

Menzel, Herbert
Information Needs and Uses in Science and Technology, in Annual Review of Information Science and Technology, v.1. Interscience, 1966, p. 41-70.

Meyerhoff, Erich
Medical Library Center of New York. Bulletin of the Medical Library Association 51:501-506 (1963).

Miller, James G.
Design for a University Health Sciences Information Center. Journal of Medical Education 42:404-409 (1967).

Morse, Elliott H.
Regional Plans for Medical Library Service: Medical Library Cooperation in Philadelphia. Bulletin of the Medical Library Association 52:509-513 (1964).

Murtaugh, J. S.
Communication in the Biomedical Sciences. Journal of Medical Education 37:1169-1182 (1962).

National Library of Medicine
Annual Report, 1966.

New York State University of New York. Upstate Medical Center
Biomedical Communication Network Progress Report, October 4, 1966.

Newill, Vaun A.
Report of Research and Development of Medical Information Retrieval Projects. Cleveland, 1962. 14p. (Paper presented at the Rochester Conference on Data Acquisition and Processing in Biology and Medicine).

Orr, Richard H. and Alice A. Leeds
Biomedical Literature: Volume, Growth and Other Characteristics. Federation Proceedings 23:1319-1331 (1964).

Orr, Richard H. and Vern M. Pings
Document Retrieval; the National Biomedical Library System and Interlibrary Loans. Federation Proceedings 23:1155-1163 (1964).

.... Unpublished Appendix.

Orr, Richard H. and Vern M. Pings, Irwin H. Pizer and Edwin E. Olson
Development of Methodologic Tools for Planning and Managing Library Services: Part I: Project Goals and Approach. (Unpublished manuscript, submitted to the Bulletin of the Medical Library Association for publication).

Personal Communication from Mr. Henry J. Gartland, Director, Library Service Veterans Administration, Washington, dated August 24, 1967, and including statistics collected for the Federal Library Committee as of December 1966.

Personal Communication from Irwin H. Pizer, Director, SUNY Biomedical Communications Network, Syracuse, New York, dated January 10, 1968.

Philadelphia Medical Librarians Urge Cooperative Expansion. Bulletin of the Medical Library Association 51:281 (1963).

Pings, Vern M.
Can Libraries be Monitored? (communications to the Editor). Bulletin of the Medical Library Association 54:161 (1966).

Pings, Vern M.
The Interlibrary Loan Transaction. Bulletin of the Medical Library Association 53:204-214 (1965).

Pings, Vern M.
Regional Medical Library Program. (Unpublished Draft).

Pizer, Irwin H.
The State University of New York Computerized Biomedical Information Resource, in The Brasenose Conference on the Automation of Libraries; Proceedings of the Anglo-American Conference on the Mechanization of Library Services, held at Oxford...30 June - 3 July, 1966. London, Mansell, 1967, p. 151-164.

Postell, William D.
Grant Funds and the Medical Library. Bulletin of the Medical Library Association 46:185-187 (1958).

Price, Derek J. De Solla
Big Science, Little Science. Columbia University Press, 1963.

Raisig, L. Mills
How Biomedical Investigators Use Library Books. Bulletin of the Medical Library Association 54: 2, Ap 66, p. 104-107.

Rappleye, Willard C.
Future of the Non-University Affiliated Municipal and Voluntary Hospital. (Address presented at the Meeting of the American college of Surgeons, Bronx, Chapter, May 19, 1960). (reprint).

Rees, Alan M.
Medical Libraries and the Assessment of User Needs. Bulletin of the Medical Library Association 54:99-103 (1966).

Rees, Alan M.
The Spectrum of Information Services Offered. (Paper presented at a Conference on the Present Status and Future Prospects of Reference/Information Service, March 30 - April 1, 1966, Columbia University, New York). (Preprint).

Report of the Committee on Criteria for Medical School Libraries. Bulletin of the Medical Library Association 43:99-100 (1954).

A Study of 1967 Annual Salaries of Members of the Special Libraries Association. Special Libraries 58:217-254 (1967).

System Development Corporation
National Document-Handling System for Science and Technology. Wiley, 1967.

Territorial Imperative - Information Network Barrier. Computer Group News 1:32 (1967).

Terry, Luther L.
The Crisis in Health Communications. Hospitals 38:49-51 (1964).

U.S. National Institute of Neurological Diseases and Blindness.
NINDB Neurological Information Network: Annual Progress Report, October 1966. Bethesda, Md., 1966.

U.S. President's Commission on Heart Disease, Cancer and Stroke
A National Program to Conquer Heart Disease, Cancer and Stroke. Washington, D.C., February, 1965. 2v.

U.S. Public Health Service
The Neurological Information Network of the National Institute of Neurological Diseases and Blindness. Government Printing Office, 1967 (PHS pub.no. 1691).

U.S. Veterans Administration
The Medical Library Program in the Veterans Administration. Washington, D.C., n.d. (folder)

U.S. Veterans Administration
Professional Services: Medical and General Reference Library Staff. Washington, D.C., GPO, February 1966 (Veterans Administration Department of Medicine and Surgery Manual M-2, pt. 13).

Voigt, Melvin J.
Scientists' Approaches to Information. AmericanLibrary Association, 1961 (*ACRL Monograph* No. 24).

Wayne State University School of Medicine. Library and Biomedical Information Service Center
Reports.

No. 5: Cruzat, Gwendolyn S. An Evaluation of the Interlibrary Loan Service, September 1964

No. 6: Pings, Vern M. Nursing Libraries; a review of the literature, 1900-1963. October 1964.

No. 8, Pt. 2: Cruzat, Gwendolyn S. Length of time in Processing Interlibrary Loans. April 1965.

No. 9: Frost, Anaclare. An Evaluation of the Biomedical Serial Resources in Southeastern Michigan. April 1965.

No. 10: Pings, Vern M. and Fanny Anderson. A study of the Use of Wayne State University Medical Library, pt. 1. Detroit, May 1965. 36 p.

No. 12: Pings, Vern M. A Study of the Use of Wayne State University Medical Library - Part II. June 1965.

No. 13: Report of A Seminar on Medical Library Service in Metropolitan Detroit, Womass Hospital, March 24, 1965. July 1965.

No. 14: Smith, Joan B. Study of Reference Service at Wayne State University Medical Library, January-June 1964. Detroit, 1965. 7p.

No. 15: Pings, Vern M. Study of Interlibrary Loan Policies of Midwest Biomedical Libraries. Detroit, September 1965. 13p.

No. 17: Cruzat, Gwendolyn S. and Vern M. Pings. An Evaluation of the Interlibrary Loan Service, Wayne State University Medical Library: III: Determination of Cost for Processing Interlibrary Loans. November 1966. 31p.

No. 18: Pings, Vern M. and Jo Ann Ferrario. The Revision of the Wayne State University Medical Library Subject Catalog, Using the 1966 Medical Subject Heading System. n.d.

No. 19: Pings, Vern M. Test Survey of Hospital Library Service in the Detroit Area. May 1966.

No. 20: McNamara, M. E. Establishing a Medical Library Network for the Metropolitan Detroit Area. Wayne State University School of Medicine Library and Biomedical Information Center, May 1966.

No. 21: Cziske, C. and V. M. Pings. A Study of Interlibrary Loans at Sinai Hospital of Detroit. Wayne State University School of Medicine Library and Biomedical Information Center, 1966.

No. 22: Frost, Anaclare. Availability of Biomedical Serials Titles in Four Resource Libraries in Michigan. September 1966.

No. 26: Pings, Vern M. Number and Distribution of Postgraduate Medical Students in Metropolitan Detroit. January 1967.

No. 27: Programs of Providing Access to the Scholarly Record to Post-Graduate Medical Students in Metropolitan Detroit. February 1967.

No. 28: Pings, Vern M. An Evaluation of Nine Hospital Health Service Libraries Text and Monograph Collections. February 1967.

No. 29: Cruzat, Gwendolyn S. An Evaluation of the Interlibrary Loan Service, Wayne State University Medical Library. Determination of Cost for Processing Interlibrary Loans, Borrowing Operation. March 1967.

No. 30: Andrews, Jo Ann. A Comparison of Detroit Public Library Science and Technology Division Interlibrary Loan Transactions with Wayne State University Medical Library Interlibrary Loan Transactions. March 1967

No. 31: Frost, Anaclare. Serials Available in Microform. March 1967.

No. 32: Andrews, Jo Ann. An Analysis of Wayne State University Medical Library Unfilled Interlibrary Loan Requests, January 1967. April 1967.

No. 33: Cruzat, Gwendolyn S. Analysis of Interlibrary Loan Document Flow in the Biomedical Library Network, Metropolitan Detroit, January - June 1966. April 1967.

No. 34: Pings, Vern M. Library Service for Health Care. Detroit, 1967.

No. 35: Classified Checklist of Medical Reference Books and Monographs of Wayne State University School of Medicine Library. April 1967.

No. 36: Pings, Vern M. Availability of Hospital Health Science Library Service to Wayne County Medical Society Members. May 1967.

No. 37: Cruzat, Gwendolyn S. and Vern M. Pings. Identification of Interlibrary Loan Users in the Biomedical Library Network, Metropolitan Detroit. June 1967.

Weber, Helen E.
Nursing School Libraries in the Three-State Area. _Bulletin of The Medical Library Association_ 44:25-29 (1956).

Werner, David J.
A Study of the Information-Seeking Behavior of Medical Researchers. Thesis, Northwestern University School of Industrial Engineering and Management Science, Evanston, Ill., December 1965. 102p.

West, Kelly M.
Role of the Library in Learning to Learn Clinical Medicine. _Journal of Medical Education_ 39:910-917 (1964).

Williams
Medical Deposits in the MILC. _Bulletin of the Medical Library Association_ 51:41-43 (1963).

Williston, C. Lincoln
Stimulating Growth and Development of Medical Society Libraries. _Bulletin of the Medical Library Association_ 55:48-51 (1967).

Wilson, Marjorie P. (and others)
Extramural Programs of the National Library of Medicine: Program Objectives and Present Status. _Bulletin of the Medical Library Association_ 54:293-310 (1966).

Wilson, Marjorie P. and Martin M. Cummings
The National Library of Medicine: Relationship to Medical Education and Research. Journal of Medical Education 40: 225-232 (1965).

Yast, Helen T. and Raymond H. Giesler
A Report on the Survey of Hospital Professional Library Service. American Hospital Association, 1964 (Unpublished Draft).

Xerox Corporation Education Division
Datrix. Ann Arbor, Michigan, University Microfilms Library Services, (1967?).

APPENDIX A

A SHORT DESCRIPTION OF WORK PERFORMED AT THE INSTITUTE FOR THE ADVANCEMENT OF MEDICAL COMMUNICATIONS TOWARD THE DEVELOPMENT OF METHODOLOGICAL TOOLS FOR THE ANALYSIS OF LIBRARY SERVICES AND THE LIBRARY'S USER GROUP[1]

The work of the IAMC has been mentioned throughout this report. As far as could be ascertained, it represents a first attempt to apply the scientific method to library activities which have heretofore resisted measurement. Because this writer considers it vitally important that librarians apply standard tests which yield uniform data, usable for planning purposes on the local as well as regional and national levels, the several projects developed by IAMC are described here in greater detail than in the report.

In 1966, the IAMC was awarded a grant by the National Library of Medicine "to develop methods for collecting data suitable for planning and guiding local, regional, and national programs to improve biomedical libraries and the biomedical information complex." Unlike other library studies whose purpose it is to collect data, the purpose of the IAMC's project is to develop methods, so that data can be gathered on a more meaningful basis.

Five tasks were defined, as follows:

---

[1] This description is based on three progress reports from the IAMC and an unpublished manuscript submitted to the Bulletin of the Medical Library Association and entitled "Development of Methodological Tools for Planning and Managing Library Services: Part I. Project Goals and Approach", prepared by Richard H. Orr, Vern M. Pings, Irwin H. Pizer, and Edwin E. Olson.

1. Development of a method to measure a library's ability to provide documents on a quantitative basis
2. Development of a standard inventory of a library's services to its users
3. Development of a method for identifying, enumerating, and characterizing a library's user population
4. Development of a quantitative method of measuring certain kinds of reference services
5. Evaluation of alternative methods for measuring utilization of a library's services.

The tests developed would have to meet certain requirements: All should yield quantitative, reliable data, and they would need to be understandable for librarians and administration alike. They should be inexpensive to administer, by library staff rather than outside surveyors, and they should be uniformly applicable to all types and sizes of biomedical libraries in academic institutions. (It should be noted that, with slight modifications, they appear to be applicable to all biomedical libraries, and not just to those in academic institutions).

The Wayne State University Medical School Library and the Medical Center Library of SUNY Upstate in Syracuse have served as laboratories for all tests as they were developed. Several other libraries have cooperated in one or more field tests also.

The principles guiding the investigators have been stated as follows:

1. The library is viewed as a "Black Box". The library's mode of operation is of no consequence to the user, only the effectiveness of its services to him.
2. Library services can be classified by function:
   a. Providing documents
   b. Providing citations
   c. Providing answers

d. Providing work space and facilities
e. Providing instruction and consultation
f. Adjunct functions (editing, translating, etc.)

This classification is useful because it avoids the vagueness presently associated with library terminology, e.g. "reference services" is a term which means whatever the library chooses to define as such service.

3. The effectiveness of library services can be assessed by the user This can be done in terms of "cost" to the user, such as time spent, effort required, and fees paid for services.

4. The role of the library among the user's various information sources can be assessed. The "primary library function" can be defined.

5. The information complex is dynamic and competitive Libraries compete with other information media for the user's utilization. The user will use what offers the greatest cost-benefit ratio. A library's effectiveness cannot be measured in terms of present services; non-existent utilization by potential users must be considered in any overall evaluation.

By careful definition of terminology where none existed before, and by working out methods of applying the tests so that they would yield valid answers, the several instruments were developed; these are described below.

1. A document delivery test has been developed, assessing the availability, in the library, of a given document at a certain time. Samples of 300 documents were drawn from citations in local faculty publications as well as from the writings of the national biomedical community. Each of these titles was checked against library holdings to see if the library owned it and to assess its current status.

2. An Interview Guide was produced to assist in analyzing library policies as seen by library personnel. The "tree" method of stating questions and alternatives for answers is used; that is, if

the answer given falls into the first category, the interviewer would check the appropriate box on the answer sheet and would proceed to another question (not necessarily the next one) according to instructions. If the answer fell into a second category, it would be recorded in the appropriate box, and another path of questioning might be chosen, depending on instructions. This method has the advantage of providing for several alternatives, rather than only one, and provides great flexibility in obtaining answers.

A carefully defined and very comprehensive list of situations is described in the "tree" questionnaire. Each category of user is defined in terms of policies pertaining to him (as opposed to all other users).

3. Another test assesses the place of the Library in the user's repertoire of information resources, as seen by the librarian. An abbreviated inventory of services is part of this survey (taken from no. 1 above).

4. Another instrument has been developed to assess a library's capability for supplying interlibrary loans. This was developed specifically for libraries functioning as reservoir libraries. It measures delivery time, and document availability under actual working conditions, rather than the library's theoretical capability. Along with this goes an inventory of interlibrary policies, which should be especially useful for the development of regional and national cooperative programs.

5. A complex, but highly useful method for analyzing a library's population has been developed; by use of a matrix, users can be characterized by background and function simultaneously, offering a highly interesting picture of the composition of a given user group. It also measures such factors as the usual path taken by the user from home to work, his movements during the day, his primary and secondary activities, and his information collection habits, including all possible sources of library material.

6. Another test measures a library's ability to verify citations from its collection. Both the performing librarian's ability and the availability of the necessary bibliographic tools are assessed.

7. A method is being developed to elicit information from users about their library utilization during a given time-period. Rather than using questionnaires or similar methods, relying on recall alone, which has proved to be a highly unreliable method, this test uses electronic random alarm devices, "RAMS", to remind the user to record the activity he is engaged in at the time the RAM goes off, if it involves information gathering.

Further work concerns refinements of the tasks outlined above, an attempt to utilize standard library statistics for predicting a library's document delivery performance, and the development of methodologic tools for regional library systems. This latter work has particular applicability for this paper. The internal document flow among members of a library systems are studied, and methods developed to predict the load of requests on individual members and the total document demands of the region.

The development of a cost-benefit model for document delivery performance is also under consideration, as is an analysis of hospital library functions.

As may be readily seen from the brief descriptions, which do not, by any means, do justice to the work, all of the various tests can and should be used to assess the various libraries' capabilities for serving as elements in a national system. It cannot be urged too strongly that the application of these tests should be part of any comprehensive planning activity involving biomedical libraries.

APPENDIX B

COPIES OF INTERVIEWS CONDUCTED WITH PHYSICIANS AND RESEARCH PERSONNEL DURING SEPTEMBER AND OCTOBER 1967

In the following pages, eleven interviews with physicians and researchers are reproduced. These were conducted both with personnel at the University of Mississippi Medical Center and physicians in the city of Jackson.

Purpose of the interviews was to supply background information to the writer, who was relatively unfamiliar with physicians' information needs.

A letter and brief description of a proposed biomedical communication system was sent to each interviewee in advance. Interviews were conducted with the aid of an interview questionnaire for the use of the interviewer, which is attached.

A BIOMEDICAL COMMUNICATIONS NETWORK

Today's physician has available to him an overwhelming amount of information to aid him in his work. This includes printed materials, such as journals, handbooks, drug brochures and the like in his own office, nearby libraries, and reprints obtained from colleagues. It also includes contacts with drug company representatives, pharmacists, colleagues in the city, attendance at seminars for continuing education, meetings of medical societies and associations. It may include, depending on geographic location, viewing of medical television broadcasts and the like.

The design for a national network to collect and disseminate information to the practicing physicians will be based on the following considerations:

1. Is the present amount and type of information adequate to meet the physician's information needs?

2. If not, what needs to be done to make it so?

Information might be divided into two categories:

1. Tactical: Factual information for answering specific questions. Included might be drug composition and dosages, antidotes for specific poisons, information about occurrence of communicable diseases in the area, or names of specialists for patient referral.

2. Strategic: Provides case histories, latest findings on treatment of a specific disease, reviews and summaries of current findings in a specialty.

Much of the above two types of information in available in various forms at the present time. Often tactical information is already out of date when it is first published; summary and review articles might not be available in the field or on the subject desired. Often it is a question of where data is collected and available - the location of data sources becomes the problem.

Audio-visual media have played an increasing role recently in the continuing education of physicians. Closed-circuit television, the electronic transmission of EKG's over long distances, facsimile transmittal of journal articles and microfilm via telephone lines are some examples.

To bring all the various kinds of information and data closer to the practicing physician, in the form in which he needs them and as soon as possible after they become available, is the eventual goal of the biomedical communications network.

QUESTIONNAIRE

Name Dept. or Affiliation

Specialty Address

City State

1. What is your reaction to the brief description of the BMC included in your letter?

2. Do you feel that the three categories of information described are those which you do or could use the most?

3. What are your present sources of information:
    a. Drug information: (dosage, composition, prices)

    b. Antidotes to Poisons:

    c. Treatment information:

    - d. Diagnostic information:

    e. Latest findings on a particular disease:

    f. Background or review on current treatments?

    g. Information on location of specialists?

QUESTIONNAIRE - cont'd.

e. Communicable disease incidence:

f. Other:

4. To what extent do you obtain information yourself?

5. How much information gathering do you delegate and to whom?

6. What are your needs that are not being met with current resources?

7. What about continuing education? Would TV broadcasts be a means?

8. If you had the type of information service described above, would you be willing to pay for it? What order of magnitude?

B-5

INTERVIEW

Dr. [redacted]
General Practitioner,
[redacted]

Date: September 2, 1967
Duration of interview:
35 minutes

Dr. [redacted] a general practitioner in the city of Jackson.

Dr. [redacted] my first interviewee; therefore he did not receive the advance material and was not briefed on the project before I saw him. I asked him to look over the letter and brief statement which he approved.

Dr. [redacted]'s chief sources of information are the journals and books he buys for his personal library. Journals consist of JAMA, Southern Medical Journal, Journal of the Mississippi Medical Association and a few others. When he finds book reviews in these journals, he orders the books that interest him. He stressed the importance of good reviews so that he can evaluate the books before buying them. He has no personal indexing system, but relies on his memory and printed indexes. He receives a great deal of free literature from drug companies which he uses heavily in his daily work.

Dr. [redacted] stated that lack of time was the chief obstacle to meeting his information needs adequately. He always obtains the information himself rather than delegating it to anyone else.

He agrees with the concept of strategic versus tactical information.

Sources of tactical information for him are:

PDR
Drug detail men
Drug brochures and fliers
Information from colleagues (He does not prescribe a drug unless it has been favorably reviewed in the literature, or a colleague whom he respects recommends it.)
The extensive library of two pathologists in an office next to his.

Sources of strategic information are:

His own journal and book collection
The library next door
Attendance at professional meetings (always away from [redacted], so that he may concentrate on his education rather than being called to the telephone constantly)

Case histories are most important to him, especially if they describe new methods of treatment, and he searches the literature for these.

He stated that one of the commercial television stations in [redacted] at one time offered closed-circuit television broadcasts of medical education programs which he attended. After a time, he found the time of day at which these programs were offered inconvenient and stopped going. The closed-circuit television broadcasts at the medical center are not useful to him for they are not specific enough to suit his needs.

Dr. [redacted] stated that he felt that his information needs were met to a satisfactory degree but that the following would make for vast improvements:

Better critical reviews of books
A means of evaluating journal literature for him, that is, as he stated it, "separating the chaff from the wheat"

The concept of a BMC left him with little reaction, but a description of the services available to any physician in this state by our own medical library were met first with disbelief and then enthusiam. He simply was not aware that he could request journal articles in xerox copy form, could use the library to review the literature and to use the indexes, as well as evaluate new books. When it was suggested to him that his secretary might pick up the phone and ask a specific question from the medical library, he was delighted and thought that this would be a most valuable service to him (two days later this library did indeed get a phone call from his assistant which resulted in the provision of a xerox copy of a journal article). When asked if he had ever used any library he said he had, but that the ones at the [redacted] Hospital and the Board of Health were inadequate to meet his needs. Therefore, he was especially gratified to learn that he could indeed use University Medical Library. He felt that if he did this, his needs would be very well met.

Upon questioning him further on audio-visual means of furthering his education and keeping up with current developments, he stated that he would like to have available to him medical television broadcasts which he could view at his convenience either in his office or at home. This would be especially useful if an answer-back facility were built in where questions could be asked from the lecturer; however he does prefer seminars where attendees and lecturers can discuss freely and ask questions. The subject matter should be such that a general practitioner might derive immediate benefit from it.

INTERVIEW

Dr. [redacted]

Date: September 19, 1967
Duration of interview:
40 minutes

Dr. [redacted] considers himself primarily a teacher. He stated that 100 percent of his time was spent in teaching, and patient care was part of his teaching function. He does write some, but does not consider himself engaged in research. He has accepted the responsibility for keeping up with information in the field of cardiology for the medical school. He has an extensive private library, encompassing all major journals in the field of general medicine as well as specialty journals and books. He maintains a listing of pertinent journal articles and books under broad subject classification, and in chronological order.

Dr. [redacted] basically agreed with the concept of tactical versus strategic information, but preferred to call it vertical versus horizontal information, horizontal information being strategic and vertical being tactical.

For tactical information he uses the following sources:

Printed materials
Information obtained at meetings
Contact with colleagues
Sometimes, very occasionally, a television seminar (He usually does not consider these specific enough to meet his needs.)

For strategic information, he almost always uses the library collection to answer questions such as "Has anything been published on this subject for the past x many years?" or for a search in a field in which he is only marginally interested.

He does not delegate any of his information seeking activities, but prefers to do it himself. Only occasionally does he delegate a literature search to a medical student during the summer months. He does not consider a secretary qualified to do the kind of critical searching which he does. Upon suggesting that a clearly defined search could be taught to an assistant and carried out by him sucessfully, he agreed that this might be so, but he would lose the immediate feel for the literature that he gets now.

Dr. [redacted] stated that his information needs were being adequately met but that he would like to have printed materials available much more quickly than at the present time. He loses interest in obtaining an article if it is not available locally and if he has to wait for it or if a translation is required. If he could depend on having the material within two or three days, he would continue to be interested in it. Dr. [redacted] did not feel that audiovisual materials would aid him in his information gathering activities but considers them a valuable teaching tool for his students. He considers himself in the role of an information producer rather than seeker in the conventional meaning of the word.

Dr. [redacted] stated that he felt consoles, either at home or at the library, which would provide him with rapid access to the index to the literature and hard copy output would be useful. When suggested that TWX plus facsimile transmittal would do virtually the same job, he responded with enthusiasm and stated that if the time element could be cut to a negligible delay, he really did not care by which means the information came to him.

INTERVIEW

Dr. [redacted]
[redacted]

Date: September 20, 1967
Duration of interview:
30 minutes

Dr. [redacted] considers his primary responsibilities teaching and research. He divides his time equally between both, with patient care being considered part of his teaching activity. He agreed with the concept of tactical versus strategic information.

His chief sources of tactical information are:

PDR
Textbooks
Contact with colleagues
The medical library

For strategic information, he uses his own journal collection and his extensive reprint collection. He subscribes to all major journals in the field of general medicine as well as two specialized ones in the field of genetics. He has an extensive subject classification for reprints in his own collection.

Specifically, he uses the following sources for:

Diagnostic information:
a. Reprint collection
b. Textbooks (Cecil and Loeb)
c. Index to JAMA
d. Archives of Medicine, Lancet, etc.

If within diagnostic information the data desired are tactical rather than strategic, he often turns to a colleague if the information wanted is outside his specialty.

New developments in the fields:

His secretary has been trained to use the library. His chief source of information is Science Citation Index. He finds a significant article and traces references to it forward to the present time. This he finds a great time saver as opposed to searching Index Medicus. He scans Current Contents regularly and marks articles he wishes to see for his secretary to obtain from the library. He also marks it for obtaining reprints either from SCI direct if he is rushed, or from the first author cited. This is the method by which he has built up his reprint collection.

He feels that his information needs are being adequately met both from the published literature and from the throwaway literature under which he classes house organs published by drug companies. He stressed that these often provide more important, timely information than the professional journals.

A service which he would expect from the BMC is the provision of the equivalent of Current Contents via computer. Next he would indicate for which of the articles listed, either on a console or as print-out, he wished to see abstracts which he would also expect to be available in computer print-out form. If he then decided that he wished to see the complete journal article, he first suggested that this too should be available from the computer. When I suggested that another way of obtaining a hard copy might be a facsimile of a journal located elsewhere, he was quite satisfied with that but stressed the necessity of having it within the day rather than waiting for interlibrary loans for days and weeks as at the present time.

He did not comment on other electronic means of serving his information needs, but would be well satisfied with having information, which he now scans and then orders, available on a more accessible basis.

INTERVIEW

Dr. [redacted]
[redacted]

Date: September 22, 1967
Duration of interview:
45 minutes

Dr. [redacted]'s specialty is the field of pharmacology. He spends fifty percent of his time in research and fifty percent in teaching and administration of the department. He considers himself a source of information for practicing physicians, students, and colleagues.

Dr. [redacted] agrees with the concept of tactical versus strategic information. His information habits are heavily library centered. Although he has a large personal library, it consists primarily of books acquired before he joined this center and very few journals. His sources of tactical information include:

Drug information: Chemical Abstracts
Journals
Textbooks
PDR

Antidotes to poisons:
Books on toxicology
Journal articles

His sources of strategic information, primarily used in his research activities, include:

Chemical Abstracts
Beilstein's
Current Contents
Science Citation Index

For lecture preparation he uses primarily textbooks. He stated that although currency is of importance he has not used Index Chemicus or Chemical Titles very much in the past.

His contact with colleagues, either at scientific meetings or personal conversations in the Center, are considered important but not as important as printed information.

Dr. [redacted] does not delegate his information-gathering activities. He states that this is partly from habit and partly because he enjoys doing this. Too, he considers himself better trained than any assistant he might attempt to instruct. He considers his information requirements well served but would appreciate more rapid document delivery either by facsimile or computer print-out. Waiting for interlibrary loans is inconvenient to him.

He also thinks that a direct access to computerized indexes would be most helpful to him, eg. the Chemical Abstract tapes would provide a searching capability which he does not now have. He dreams of a master index to all biomedical literature which he can search either himself or through the library. He feels that he does not necessarily need personal access to this store as long as a console or similar apparatus would be available in the library which might query the central store of information. He then expects to pick desired references which would need to be delivered the same day or at least two or three days hence rather than the longer time it presently takes to obtain interlibrary loans. He stated that his need for pertinent references was often rather urgent and he is reluctant to wait for it.

INTERVIEW

Dr. [redacted]
[redacted]

Date: September 25, 1967
Duration of interview:
40 minutes

Dr. [redacted] is a specialist in [redacted] in private practice. He also spends some of his time teaching his subject to junior and senior medical students. He considers this a very minor part of his professional life. Dr. [redacted] agrees with our division of strategic/tactical information.

He is a highly skilled specialist who considers it his responsibility to know virtually everything there is to know about his field. He attends regional, national, and frequently international congresses of dermatologists where he obtains a great deal of current, timely information. The discussion of specific cases at these meetings provides a most valuable means of information; some of these cases have been followed for a number of years and are presented at regular intervals to a particluar group so that they may study progress of treatment over a long period of time.

His sources of information are the journals and books in his private library which is extensive. He does not subscribe to journals in the general field of medicine but reads primarily in the field of dermatology where he obtains virtually everything of importance in his field.

Sources for tactical information are:

Personal experience
PDR
Detail men
Drug brochures

(Dr. [redacted] stated that very rarely did he learn anything new from a drug salesman; that he was familiar with most medication in his field, and that although the brand name may change the components were known to him, he could assess their potential usefulness.)

Sources of strategic information are:

For latest diagnostic and treatment information:

Journals
Books
Annual reviews
Archives of Dermatology
Attendance at meetings

(Dr. [redacted] states that he does turn to the literature first but that often a single fact learned at meetings makes this a most important source of information for him. The presentation of cases as mentioned above is also a very useful part of his meeting experience.)

Dr. [redacted] does his searching and information gathering himself; he does not consider anyone else qualified to do this for him nor is it necessary because of the completeness of his personal library.

When asked about television or films as a medium for seeing skin disease symptoms visually displayed, he stated that he did not feel that this would be useful to him, that there was no substitute for seeing an actual case, especially if it were presented over a period of months or years to study the same patient over and over again.. He did, however, consider it a useful teaching medium for medical students and knows that films have been made in his field.

An interesting bit of information picked up from Dr. [redacted] was that he often writes to drug companies describing patients' reactions to their drugs and in effect presenting short case histories to them for their information. He said that he got very little feedback or appreciation for this but considered it a part of his professional responsibilities. When I suggested that this might instead go to a central clearing house where it would become part of the record available to all dermatologists, he thought that this would be a very useful feature of any communications system. He did not respond particularly well to any other facet of a BMC but considered his information needs well met with present resources.

INTERVIEW

Dr. [redacted]

Date: September 25, 1967
Duration of interview:
35 minutes

Dr. [redacted] is an administrative officer in the State Board of Health. He was interviewed because he might conceivably benefit from a BMC in quite a different way than other physicians. It was felt that through him much information is channeled upward and downward and that if he had access to more or better information it might improve his effectiveness.

Dr. [redacted] responsibility is to plan and design programs for the prevention of specific diseases, to come up with satisfactory cost/benefit ratios for new programs, and to maintain existing ones.

Dr. [redacted] cooperates closely with the Communicable Disease Center on the national level, to which he submits statistics on a regular basis, and from which he obtains much prepackaged information which is of direct benefit to him. He obtains, in addition, a great deal of his information from other branches of the Public Health Service which does a generally outstanding job in supplying printed material to state and local public health practitioners.

Much of his activity consists of following up on reports of communicable disease incidence within the state. Much of this is done by telephone, e.g. another state health officer from a distant place will call him to notify him that someone has contracted a disease to which he was exposed in Mississippi. Then it becomes Dr. [redacted] job to locate the contacts and to isolate them if possible. All this activity is done by telephone, because time is of the essence.

Because of his familiarity with the telephone as a communication device, he obtains other information in this manner also which might normally be thought to come from printed sources. He has a good basic office collection, calls upon the Board of Health Library and the CDC Medical Library to some extent, but primarily telephones other public health officers when he needs information. Short courses and formal training were also mentioned by him as part of his information gathering activity.

Almost all of his information-gathering is for tactical information, and he uses the above sources as outlined. The State Board of Health has an excellent statistical unit which supplies him with much data; in return it is his division's responsibility to feed data to the statistical unit which then transmits it by telegraph to the national health statistics facility.

Dr. [redacted] stated that a program is presently under study whereby the reporting of these various divisions from all the states might be transmitted to the national facility via electronic media; exactly how this is to work is yet to be developed. He also stated that immediate electronic access to the national health data base would be of great value to him, especially if there were some means for him to "talk back" to the data base in order to define or refine his question more clearly. A two-way communication seems to him to be essential for this system to be sucessful. He would consider having such a facility in the library rather than in his office if he could be sure that the personnel in the library would be trained in such a manner that they would understand his needs and provide an effective interface between him and the data base.

He considers his information needs well met with present resources, except for the more rapid access to the data, as outlined above.

INTERVIEW

Dr. [redacted]
[redacted]

Date: September 25, 1967
Duration of interview:
45 minutes

Dr. [redacted] is not only in charge of [redacted], but the following programs are also under his direction:

Nursing home licensure
Medicare Certification
Diabetes control
Heart disease control
Adult vision conservation
Chairmanship of Planning Committee,
Regional Medical Programs

Dr. [redacted] interview was one of the most interesting yet because of his very real recognition of his information needs. He has many responsibilities indeed which require him to have a broad knowledge of everything from federal regulations to preventable disease control, and from medical politics to local economic statistics. Although he has access to all of the public health service publications, he feels that he cannot possibly keep up with all the reading that is necessary to be equally up to date on the varied programs under his direction.

A very real need of his division is hard data on the incidence of disease in this state and on the utilization of hospital and other health care facilities. Estimates are available on a national level but are not very often appropriate to this state. Private physicians' reporting requirements are insufficient; the only diseases on which they must report are tuberculosis and syphilis, all other reports are on a voluntary basis and therefore, not accurate. Because he has to assess facilities as to their suitability for Medicare, his need for criteria for nursing homes is acute. Such criteria or standards do not exist to the extent that he needs them. The above data needs would in his case be classed as tactical information although the use made of them is certainly strategic. He recognizes that original research needs to be done for the kinds of data he needs.

For background reading on policies and regulations, which would be strategic information, he reads a number of journals in the public health field, JAMA, American Diabetes Association Journal and others. The library is used by him primarily for reading out of state newspapers so that he may know what neighboring public health departments are doing.

He, too, is concerned with appropriate cost/benefit ratios and is hopefully looking forward to prototype programs being planned now by the National Center for Chronic Disease Control, which will be very helpful to him.

When asked about his information needs that were not presently being met, a very real need for him and probably for other physicians is a tailor-made SDI service. He has to keep up with so many differing fields that this is almost essential if he is to be successful in his work. When an SDI service was described to him, he responded with very real enthusiasm and said this would save him an enormous amount of time and would be exactly what was needed. His situation is such that the timesaving is perhaps the most important feature any proposed system might offer to him. He felt that he could define his needs in such a way so that his interest profile could be used successfully to supply him with the desired information.

INTERVIEW

Dr. [redacted]
[redacted]

Date: October 11, 1967
Duration of interview: 35 minutes

Dr. [redacted] is the [redacted]. Ten percent of his time is spent in administration, twenty percent in research, twenty percent in classroom teaching and fifty percent in his specialty, which he considers a teaching activity also.

Dr. [redacted] states that he rarely has need for immediate delivery of documents.

His chief source of information is attendance at meetings. He does not believe that the general practitioners have the same need to keep up with specialty training via attendance at meetings that he has. His meetings are scientific congresses all over the world at which he usually delivers papers. He also spends a considerable amount of time in preparing books and journal articles.

When preparing a manuscript, he has need for exhaustive literature searches, including translations. He owns Index Medicus and searches this at night, prepares a list of references, and has a secretary pull together the material. He then looks it over to choose the articles which are appropriate for his immediate needs. He feels that the library covers his subject adequately but that missing issues and volumes are a considerable problem.

He orders reprints directly from the authors in large numbers. This reprint file which he keeps in classified order (for approximately five years), is used in the preparation of his written material, as well as sources from the library. He evaluates the literature carefully when choosing articles, chiefly by reputation of department and author as well as methodology. He does not use Excerpta Medica.

When asked about the use of television, he stated that it should be used much more heavily in teaching but that the available video tapes were not what he preferred as a teaching medium at this point. His explanation was that failures were rarely shown, but only successful operations in which everything went smoothly. He feels that if things go wrong, they too should be shown which would provide a valuable experience for students.

Dr. [redacted] expressed general satisfaction with present information services and had little to add in the way of suggestions for improvement.

INTERVIEW

Dr. [redacted]

Date: October 15, 1967
Duration of interview: 45 minutes

Dr. [redacted] has on her staff a number of psychiatrists, psychologists, several residents from the Medical Center, senior medical students, and others. The chief area of activity is psychiatric care for children, although adults have been served if they were financially unable to obtain psychiatric services from a private physician. There are at present three regional offices in [redacted] which will soon be phased out and will be supplanted by a comprehensive mental care program, funded from and directed on the local level.

Dr. [redacted] stated that her information needs were well met. In her office, several subscriptions of major psychiatric journals are received either by her or other members of the staff. New journals are scanned as they are received, marked when an important article is found, and deposited in the conference room where the rest of the staff may have access to them. Each staff member also has an office library of basic symposia and textbooks. One staff psychiatrist maintains a detailed subject index of psychiatric literature in card form.

Attendance at meetings is by far the most important source of information for her, her staff members, and mental health workers in the state. A large number of meetings are held by professional associations, her own department, regional groups, etc. and are attended by everyone. Her own department conducts a journal club for which medical students are responsible. Rather than reviewing certain journals, this journal club consists of reviewing material on certain topics once every two weeks, necessitating a fairly comprehensive literature search in the [redacted] Medical Library. In between, there are staff meetings at which new findings are presented. In addition, she and many members of her staff attend lectures at the psychiatry department of the [redacted] Medical Center with which they maintain close relationship.

Another source of information is the State Board of Health Library which is primarily used for the more general material in the field of vital statistics and social work. All mental health workers in her department throughout the state are brought together for monthly two-day conferences. A guest lecturer is usually brought in who will discuss a topic of current importance.

Interlibrary loans are obtained through the State Board of Health Library infrequently, since the need for them does not arise very often. [redacted] Medical Library is used for in-depth searches and older material.

When asked about audiovisual media, she mentioned a very excellent film library located in the State Board of Health which is heavily used by her staff members and referrals are made to groups in the state which wish to show programs on mental health and mental rehabilitation. These films are reviewed when first acquired and are tagged for either professional or lay group use. They may be used by anyone in the state. She uses them for in-service training as well as for supplementary material in lectures for which she is responsible at the [redacted] Medical Center.

Dr. [redacted] stressed the importance of meetings over and over again as the chief source of information. She did not feel that there were any information needs presently unmet. When I suggested state-of-the-art-reviews and syntheses of current knowledge in her field, she agreed that this would be useful but she stated again that she considered herself well served at the present time.

INTERVIEW

Mr. [redacted]

Date: October 16, 1967
Duration of interview: 45 minutes

This was a relatively unstructured interview. Mr. [redacted] is extremely knowledgeable in the field of continuing education for physicians. He told us of plans to conduct a study using questionnaire techniques asking physicians in [redacted] their opinion about a proposed postgraduate institute for physicians. This would be a five year program beginning at the time the physician leaves his internship and will be especially tailored to his individual needs. He would receive books and other materials as a matter of course. He would have a faculty advisor on the staff and would be brought in for continuing education courses. This program would be a well structured attempt at providing planned continuing education for physicians in the state. It will be carried out under the regional medical programs. Full profiles of graduates will be available to the program during the design period.

One of the techniques considered would be to supply FM radios (portable) which the physician could carry with him wherever he might be. For four to six hours a day, articles would be reviewed and other information conveyed to him in this manner.

Mr. [redacted] said that television was a very good medium to provide postgraduate education. It would have to be in color, however. He feels that these sets should be placed in hospitals first (there are 128 hospitals in [redacted]), because the cost to the individual physician would be too high. His concept very much includes the hospital as a local outlet for continuing education. Each hospital would have a person and a communications device to be in constant touch with physicians in the area and to provide them with the information they need.

In response to my questions about the proposed BMC, he expressed a hope that pharmaceutical information, now distributed via detail men and brochures, might become part of a central information facility. Perhaps the Pharmaceutical Manufacturers Association could be approached for the funding of such a center.

INTERVIEW

Dr. [redacted]
[redacted]

Date: November 6, 1967
Duration of interview: 45 minutes

Dr. [redacted] has been primarily engaged in research in the past. More recent responsibilities include teaching a number of courses in epidemiology and public health.

He is aware of plans to index material on epidemiology under the auspices of the American Public Health Association, and is looking forward to this publication eagerly. He expressed frustration with Index Medicus and similar sources when trying to find material in epidemiology, because it is so widely scattered under different headings.

His work concerns the assessment of certain factors in a limited population ([redacted] county high school students: he is studying their blood pressure patterns and looking for relationships to heart disease.) His information sources are primarily government publications such as Vital Health Statistics, PHS Reports and those of the Communicable Disease Center in [redacted]. He is on the mailing list for most of this material and has not used the library to obtain this information.

Being faced with teaching responsibilities for the first time has made his approach to information slightly different. He now needs to catch up on developments in bacteriology, immunology, epidemiology, physiology, and for this he has been using the library heavily.

He subscribes to Current Contents and a six months' compilation of Public Health Service Reports as well as publications in veterinary medicine [redacted], State Health Department publications, etc. He ranks public documents as his first source of information followed by journals. Books are used only for brushing-up in order to teach his course. Meetings are not as important to him as to some other interviewees, but he stated that they do expose him to current research to some extent.

He normally does his information gathering himself, only delegates preliminary searches to nurses working as his assistants. He makes final selections.

He has a personal file of index cards arranged by author which relate to his particular field: hypertension, blood pressure, etc. His reprint file collects both reprints ordered from Current Contents and xerox copies of journal articles obtained from the library. When informed of MEDLARS services he seemed to feel that this would be very useful to him because of the difficulty mentioned before of obtaining material on epidemiology under a wide variety of headings.

He feels that audiovisual materials are important in teaching and public education but does not feel that they are very useful to him in his own information gathering procedures.

He uses the Department of Health Library, their film library, and their collection of statistics heavily, because the Medical Center library does not have this type of material.